

Chapter 7

Key Resources at Risk and Critical Areas

Introduction

Section 319 of the Clean Water Act requires the identification of key resources at risk. Section 6217 of Coastal Zone Act Reauthorization Amendments of 1990 requires the identification of critical areas in the State. In this chapter, the linkage will be made between these two requirements and the Unified Watershed Assessment required in the President's Clean Water Action Plan.

Key resources at risk in Washington are fish habitat, shellfish growing areas, wetlands, and drinking water supplies (quality and quantity). Information is being evaluated that will tell the status of these resources, and of mapping areas that show where impairment or stress is found. These stressed areas will be identified as critical areas. This process is currently under development and will directly feed decision processes involving funding and effort by a broad range of government, tribal and public interests.

At this time, critical areas are defined as impaired watersheds. These have been identified throughout the State using a simple approach. They are the near-term focus for watershed restoration activities described in the Clean Water Action Plan.

Key Resources Threatened By Nonpoint Source Pollution

Salmon, Steelhead and Trout

Many stocks of wild salmon, steelhead and trout have declined in Washington, the result of many factors. Some are natural and beyond our control, others have resulted directly from human activities. Economic development and rapid population growth have exacerbated conditions unfavorable to salmon production.

Table 7.1
1992 State Salmon and Steelhead Inventory Report

	Healthy	Depressed	Critical	Unknown	Extinct
435 Total Stocks	187	122	12	113	1
Percent of total	43 %	28 %	3 %	26 %	0

At the time of this writing, the National Marine Fisheries Services and US Fish and Wildlife Service have listed a number of Evolutionary Significant Units of fish stocks in Washington under the Endangered Species Act, including cutthroat trout and bull trout, as well as salmonid stocks. These agencies continue to review other stocks for future listings. Current ESA status for Washington State is:

<u>ESA Status</u>	<u># of Stocks</u>
Endangered	3
Threatened	15
Candidate	10

Table 7.2
Land Use Impacts to Salmon, Steelhead, and Trout

Land Use	Problem
Agriculture, forestry, urban development	High temperature from removal of riparian shade
Agriculture	Bank erosion from animal access
Agriculture and urban development	Low dissolved oxygen due to excess nutrients
Forestry	Coarse sediment from landslides
Agriculture, forestry, recreation, urban development	Fine sediment from road and surface erosion
Forestry, agriculture, urban development	Lack of large organic debris from removal of riparian vegetation
Urban development and water use practices	Reduced flow from over-allocation and impervious surfaces
Diking, stream modification, filling wetlands	Loss of habitat (wetlands, in-stream and off-stream areas)

Shellfish growing areas

Shellfish production in Washington ranks among the highest in the country. Washington is first in oyster production. Clam beds in Skookum Inlet (south Puget Sound) are the nation's most productive. The shellfish industry in Washington generates 70 million wholesale dollars per year with considerable potential for expansion, particularly for income-poor rural coastal counties. Since 1981, the state Department of Health or local health districts have closed or restricted for harvesting more than 46,000 acres of key shellfish growing areas in Washington due to contamination.

Table 7.3
Land Use Impacts to Shellfish

Land Use	Problem
Logging, agriculture, urban development	Sedimentation in streams, reservoirs and lakes
Agriculture	Fecal coliform and pathogens from animal access in tributaries and lack of proper manure management
Agriculture and gardening	Toxic insecticides
Suburban development	Fecal coliform from failing on-site sewage systems
Shoreline development	Bulkheads and other shoreline construction and habitat alteration

Drinking Water

Nonpoint pollutants eventually run off into surface water or leach into ground water. This hazard is especially important because 70 percent of the state's drinking water comes from groundwater.

Table 7.4
Land Use Impacts on Drinking Water

Land Use	Problem
Agriculture	Elevated nitrates from inappropriate use of animal waste, fertilizers, and pesticides
Agriculture, urban development	Toxic chemicals from inappropriate use of pesticides
Underground injection wells	30,000+ dry wells and other infiltration devices used to dispose of stormwater
Landfills	Particularly older, unlined dumps leaching and seeping toxics and pathogens
Suburban development	Nutrients and fecal coliform from failing septic

Wetlands

Wetlands and riparian areas provide critical resources to entire ecosystems. Wetlands store water, lessen flooding, and provide rich habitat for a variety of life forms. Riparian areas also provide unique habitat and help keep streams cool.

Historically, wetlands and riparian areas have been altered or destroyed to encourage development across the State. Probably 70 percent of the State's original wetlands have been filled. In the Puget Sound area, only 10 percent of all wetlands remain. Riparian areas also have suffered through destruction of vegetation, streambank erosion, and alterations to stream channels.

Table 7.5
Land Use Impacts to Wetlands

Land Use	Problem
Upstream pollution, runoff from agriculture and suburban development	Degradation of water quality in wetlands affecting biological community structure
Stormwater discharges and development-induced flooding	Detrimental changes in wetland inundation regimes
Transportation and other linear infrastructure development	Fragmentation of large, intact wetland systems
Shoreline armoring	Interruption of wetland and riparian sediment processes
Introduced species	Detrimental changes in plant and animal communities

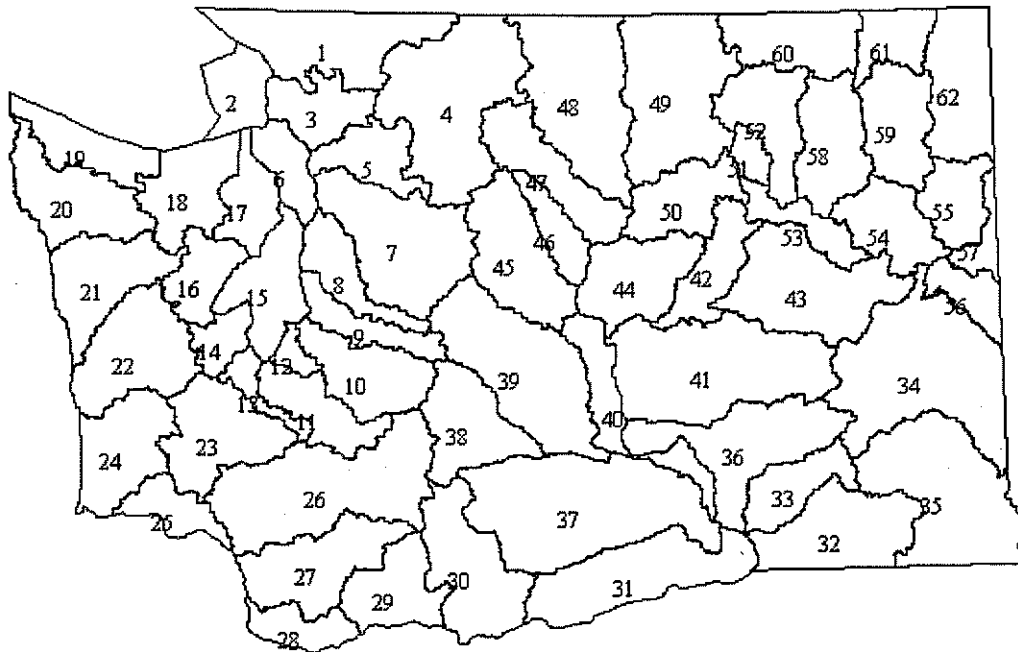
Developing a Unified Watershed Assessment - Phase 1

In August of 1998, the Natural Resources Conservation Service (NRCS) and Ecology convened representatives of State and federal agencies and tribes to develop a Unified Watershed Assessment (UWA) for Washington meeting the immediate requirements of the Clean Water Action Plan. This plan will be the basis for decisions regarding associated funds made by Ecology, NRCS, and the US Forest Service.

The workgroup completed their discussions, and an initial proposal was circulated for public comment prior to submittal to EPA for approval. The time frame to complete the Phase 1 work was very short, and this UWA was based on the best available knowledge. As a condition of agreement, the workgroup planned to further develop it to more closely align with ongoing processes and needs. This effort is currently underway.

Federal guidance also directed the UWA workgroup to develop Restoration Action Strategies for the high priority watersheds. The purpose of these strategies is to assure that UWA funds are effectively targeted. Ecology, NRCS, and US Forest Service are accountable to EPA to show that funds associated with the UWA are targeted to documented issues in the "high priority" watersheds. The restoration activities to be implemented by agencies and local governments will be identified in Chapter 9, Implementation Strategy.

Figure 7.1
Water Resource Inventory Areas (WRIAs)
In Washington



WRIA # and Basin Name

1. Nooksack	17. Quilcene/Snow	33. Lower Snake	49. Okanogan
2. San Juan	18. Elwha/Dungeness	34. Palouse	50. Foster
3. Lower Skagit/Samish	19. Lyre/Hoko	35. Middle Snake	51. Nespelem
4. Upper Skagit	20. Soleduc	36. Esquatzel Coulee	52. Sanpoil
5. Stillaguamish	21. Queets/Quinalt	37. Lower Yakima	53. Lower Lake Roosevelt
6. Island	22. Lower Chehalis	38. Naches	54. Lower Spokane
7. Snohomish	23. Upper Chehalis	39. Upper Yakima	55. Little Spokane
8. Cedar/Sammamish	24. Willapa	40. Alkaki/Squilchuck	56. Hangman
9. Duwamish/Green	25. Grays/Elochoman	41. Lower Crab	57. Middle Spokane
10. Puyallup/White	26. Cowlitz	42. Grand Coulee	58. Middle Lake Roosevelt
11. Nisqually	27. Lewis	43. Upper Crab/Wilson	59. Colville
12. Chambers/Clover	28. Salmon/Washougal	44. Moses Coulee	60. Kettle
13. Deschutes	29. Wind/White Salmon	45. Wenatchee	61. Upper Lake Roosevelt
14. Kennedy Goldsborough	30. Klickitat	46. Entiat	62. Pend Oreille
15. Kitsap	31. Rock Glade	47. Chelan	
16. Skokomish.Dosewallips	32. Walla Walla	48. Methow	

Unified Watershed Assessment - Phase 2

The long-term vision is to have a coordinating tool that

- is flexible to meet agencies/tribes' needs
- allows for consideration of restoration and preservation, and
- provides a common (i.e., "unifying") base for decisions.

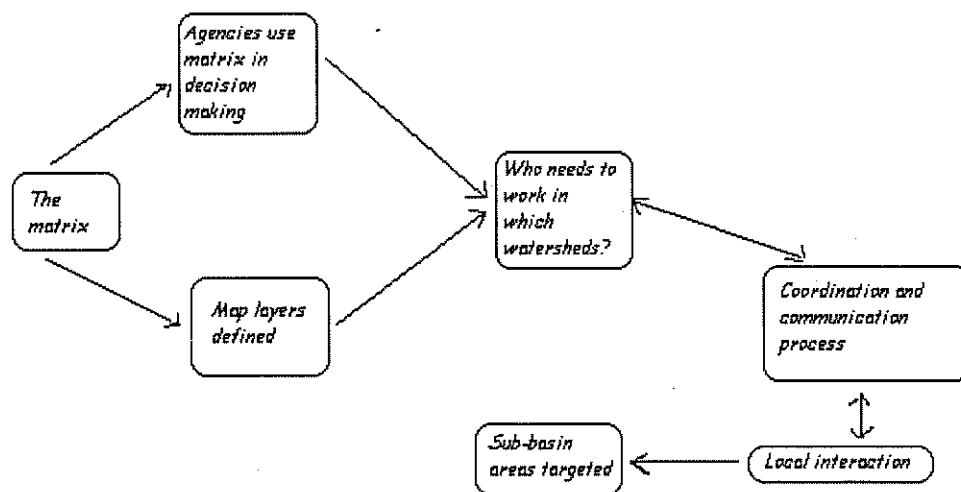
This is a vision for a process to come. Since this process is still unfolding in the context of current watershed and salmon efforts, it is difficult to describe with detail how the process will actually work. Ecology staff will work closely with the Joint Natural Resources Cabinet to further refine this concept and carry out the actions needed to make it happen.

A matrix could provide layers of environmental information about Washington's watersheds. The resource managers could use the information layers in a mix-and-match way to help make decisions regarding funding, workload, etc. They could also add "custom" layers specific to their needs.

For instance, the NRCS, in deciding how to target technical assistance, might want to consider how the water quality and fish layers line up with a custom layer on feedlot location. Ecology might want to consider water quality and public health to address a TMDL need.

Although the information in the matrix could be used in different ways, the agencies and participating tribes would be using a common consideration for decisions. Periodic meetings would compare geographic priorities using the information matrix and other agency-specific considerations. Where overlaps occur, opportunities would be sought to coordinate activities.

It would work something like this:



Phase 1 UWA used the WRIA/4th level HUC scale (approximately 62 in the state), and “basin” as used in this document refers to this scale. The information matrix may eventually be constructed at a more refined geographic scale – perhaps using the Washington Administrative Unit (WAU)/5th level HUC (approximately 800 in the State). Prioritizing by agencies would likely still happen at the coarser scale, but opportunities for collaboration, particularly with local efforts and priorities could be considered at the more refined scale.

The process is evolving toward this long-term vision. It will take time to develop the information matrix, and many details need to be worked out. Appropriate information layers, sources of data, etc. must be identified. How it will be maintained, how and how often it will be updated, all need to be determined. It’s likely that the information matrix will be developed for a pilot basin or two, and the lessons learned there will be used to further refine the concept before taking it statewide. In the meantime, there will be a tool to use during the next federal and state fiscal years – possibly longer.

Interim Matrix

For the interim, a tool can be used that moves away from a strict sorting and prioritizing of watersheds and towards the future information matrix. This interim tool will begin using the concept of layers of environmental information, but on a simple level, and still at the WRIA/4th level HUC scale.

There are three primary information layers: water, public health, and fish. The three primary layers have sub-layers. In all but one of the sub-layers, WRIAs have been classified as impaired, threatened, or (on layers where it is appropriate and possible) healthy. These terms are descriptive only in a general and relative way. Saying a watershed is “healthy” does not imply that it is free of degradation. One of the sublayers is informational only – no classification is done.

The Water Layer

The water layer has two sub-layers, flow and quality.

Flow

There are various technical problems associated with developing an accurate evaluation of flow in a stream. Many streams and tributaries have little or no data. Combined with the coarseness of the WRIA scale, this makes it difficult to compare flow adequacy. On the other hand, flow is a critical component to consider in the health of a basin.

The information layer for flow is based on a combination of two pieces of information from the January 1999 Draft Statewide Strategy to Recover Salmon – Extinction is Not an Option:

1. Assessment of Adequacy of Water for Fish, Volume 1, map page V.93, and
2. Human Population Growth from 1990 – 2010, Volume II, III - Elements of Recovery, F - Implementation to Insure Success, 3 - Educating the Public about the Needs of Salmon, Attachment 7.

Table 7.6
UWA Flow Impaired Basins

December 1999

Over-appropriated Basins	Flow set/adequacy not determined	High growth	Medium growth	Low growth
1 – Nooksack		X		
7 – Snohomish		X		
8 – Cedar Sammamish		X		
9 – Duwamish/Green		X		
10 – Puyallup/White		X		
12 – Chambers/Clover		X		
17 – Quilcene/Snow			X	
18 – Elwha/Dungeness			X	
32 – Walla Walla			X	
37 – Lower Yakima		X		
39 – Upper Yakima			X	
45 – Wenatchee			X	

For the UWA, impaired basins are those where the water resources have been over-appropriated and growth is considered high or medium.

Table 7.7
UWA Flow Threatened Basins

December 1999

Over-appropriated Basins	Flow set/adequacy not determined	High growth	Medium growth	Low growth
	11 – Nisqually		X	
	13 – Deschutes	X		
	14 – Kennedy/Goldsborough		X	
	15 – Kitsap	X		
35 – Middle Snake				X
38 – Naches				X
48 – Methow				X
49 --Okanogan				X

Threatened basins are those where water resources have been over-appropriated and growth is low, *and* basins where flow levels have been set but the adequacy of those levels has not been determined.

All other watersheds are considered UWA healthy basins. Again, this does not mean these basins are necessarily problem-free. Many flow-related problems have not been identified.

Water Quality

Under the Clean Water Act, Ecology is responsible for producing two periodic reports on water quality in Washington. These reports are named for the sections of the Clean Water Act that require them, the 303(d) List and the 305(b) Report. Because they are developed in different ways, answer different questions and serve different purposes, they create different pictures of water quality in Washington. Ecology uses them to build the water quality information layer for the UWA.

To produce the 305(b) Report, Ecology staff stratify the State according to water body type, size, and eco-region. Then, using ambient monitoring data (i.e., data from sampling designed to give an overall picture rather than targeted at a specific problem), they statistically extrapolate to similar water bodies in similar eco-regions across the State. Water bodies are classified as good, fair or poor in terms of how well they support certain beneficial uses such as swimming, and fish migration and spawning. Section 305(b) defines waters classified as fair or poor as “impaired” waters (notice below that for the purposes of the UWA “impaired” has a different meaning, and is applied to a subset of these 305(b) impaired waters).

For a representative look at the waters of the State, the 305(b) Report is probably the best tool we have. But it also has limitations. A given WRIA may have several eco-regions and a variety of water bodies. Applying an evaluation like “impaired” or “threatened” at a WRIA scale reduces the accuracy of the evaluation, since pristine headwaters can easily be found in the same watershed with degraded lowlands. Also, because of different aerial divisions for different water body types (i.e., streams are reported in miles, lakes and estuaries are reported in acres), a roll-up of different water body types is problematic.

The 303(d) List, on the other hand, focuses on identifying specific problems in specific water bodies. Each listing represents a violation of water quality standards for one pollutant in one water body segment. So, a given stream segment may be listed once for chlorine, another time for ammonia-N, and another time for fecal coliform. The 303(d) List is based on both ambient monitoring data and project specific data.

Project-specific data tends to be concentrated in areas where there is money for and interest in water quality. The more sampling done in an area, the more problems are likely to be identified, resulting in more 303(d) listings. So, although the 303(d) List is effective for identifying specific problems, it can present a skewed overall picture of the State’s waters. On the other hand, the 303(d) List is very important because the Clean Water Act requires that a TMDL (a water cleanup plan) be developed for each listing – a very high priority for State and federal governments. Implementation of TMDLs provides an excellent opportunity for collaboration leading to improved water quality.

For Phase 2 of the UWA, we will use a combination of 305(b) and TMDLs. The 305(b) Report will provide the best representation available of the overall quality of the State’s waters, with TMDLs tying back to the 303(d) List and specific water quality problems. These two criteria will be mapped together.

The 305(b) Report

For purposes of the 305(b) Report, streams are evaluated in miles; estuaries and lakes are evaluated in acres. Combining these different evaluations into a roll-up is problematic. For the most accurate picture of all water body types, we would need to provide three separate information layers. In the interest of usability, simplicity, and reasonable consistency with other information layers, we have chosen to look only at streams.

Using the latest 305(b) Report, we determined for each WRIA the percent of streams classified as fair or poor (defined in section 305(b) as “impaired”) in terms of how well they support beneficial use. We sorted the WRIsAs on that basis, then considered the top third of WRIsAs (i.e., those with the highest percentage of poor and fair streams) as UWA impaired. We considered the middle third UWA threatened. The bottom third have at least 48 percent of their streams classified as “good” and are considered UWA healthy (although it should be noted that this term is used in a relative way - having only half a watershed’s streams fully supporting beneficial uses is hardly healthy).

Table 7.8
305(b) Status by WRIA

UWA Impaired		UWA Threatened		UWA Healthy	
WRIA #	% 305(b) impaired streams	WRIA #	% 305(b) impaired streams	WRIA #	% 305(b) impaired streams
56	90	58	77	8	52
43	90	61	77	21	52
42	90	62	77	16	48
34	90	52	77	5	47
32	90	59	77	39	46
41	90	19	66	18	44
44	90	24	66	30	42
36	90	17	65	9	35
33	89	23	65	27	34
50	89	25	65	1	34
31	88	14	65	11	31
35	88	12	65	7	30
53	88	15	65	26	30
57	83	6	65	46	24
54	83	2	65	38	24
51	81	22	64	10	23
37	79	49	64	47	21
40	79	3	62	48	21
60	79	13	61	45	15
55	78	20	58	29	15
		28	58	4	11

TMDLs

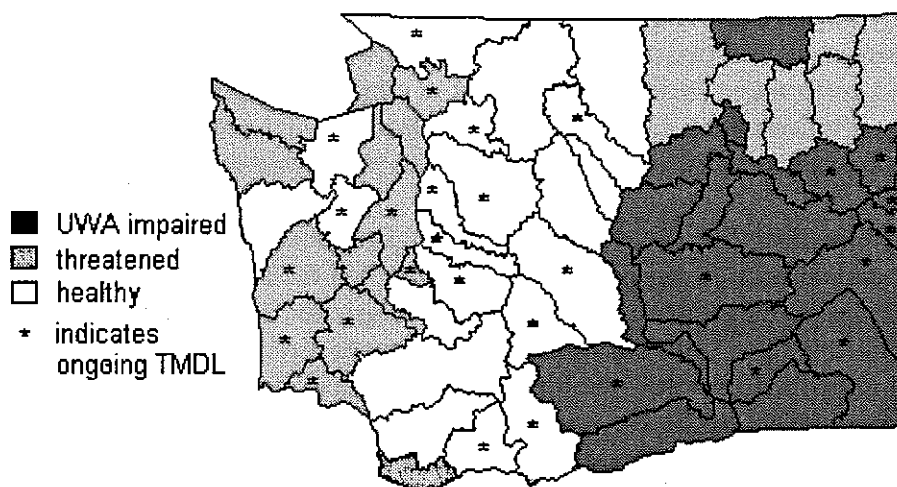
This sub-layer will show TMDLs that are in process, or that have been developed and approved by EPA, but are not yet fully implemented. WRIAs with ongoing TMDLs are noted on the Water Quality map at the end of this section by a *. (Please note that the list as presented below is currently (*October, 1999*) being reviewed by Ecology's regional offices and others, and may change in the final document.)

Since each TMDLs represents a known water quality impairment, for this layer only we will not use the impaired, threatened, and healthy classifications. Instead, for each watershed in which there are TMDLs in process or yet to be fully implemented, we have listed the water bodies involved.

Table 7.9
Water Bodies with TMDLs in Process

WRIA #	Water Bodies With TMDLs In Process or Not Yet Fully Implemented
1	Fishtrap Creek, Nooksack River, Johnson Creek
3	Lower Skagit River
5	Stillaguamish River (Portage Creek)
7	Snoqualmie River, Snohomish River (Steamboat Slough, Ebey Slough, Allen Creek, Quilceda Creek, Wood Creek marsh lands, Pilchuck River, French Creek), Woods Creek
8	Pipers Creek, North Creek, Beaver Lake, Issaquah Creek system, Tibbets Creek, Laughing Jacob's Creek, Pine Lake Creek, Eton Creek, May Creek, Larsen Lake
9	Green/Duwamish, Elliot Bay
10	Upper White River (Stuck River, Scatter Creek, Clearwater River, Greenwater River)
12	Steilacoom Lake, S. Puget Sound
15	Port Gamble Bay, Liberty Bay, Sinclair Inlet, Gorst Creek, Union River
16	Skokomish River (Weaver Creek, Hunter Creek, Purdy Creek), 10 Acre Creek
18	Matriotti Creek, Dungeness Bay
22	Grays Harbor, Duck Lake, Humptulips River, Rabbit Creek
23	Chehalis River (Black River, Lincoln Creek, Scatter Creek, Dillenbaugh Creek, Skookumchuck Creek, Salzer Creek, Newaukum River), Rabbit Creek
24	Palix River, Willapa River
25	Longview Ditches
29	Wind River
30	Little Klickitat
33	Snake River
34	Snake River
35	Snake River
37	Yakima River, Griffen Lake
38	Upper Yakima
39	Teanaway River (Stafford Creek)
41	Moses Lake
47	Railroad Creek, Lake Chelan
54	Spokane River
55	Spokane River
+56	Spokane River, Hangman Creek
57	Spokane River

Figure 7.2
305(B) Streams and WRIAs with Ongoing TMDLs



This information layer is a very coarse tool for consideration in water quality decisions. While we believe that using the 305(b) Report provides the best available overall evaluation of the State's water quality, it is far from perfect. The more diverse the geology of a WRIA, the less representative the rating will be. That is compounded by the UWA rating of impaired, threatened or healthy. Those terms are only applicable in so far as they rank the WRIAs relative to each other (sort of like grading on the curve). WRIAs classified as healthy can have serious water quality problems and those classified as impaired may have large pristine areas. Users of the water quality matrix will get the best understanding by considering the overall representation presented by 305(b) together with the existence and number of TMDLs. If the workgroup decides to go to finer scale watersheds, a better evaluation will be possible.

The Public Health Layer

The Public Health layer of the UWA has three components: shellfish concerns, nitrates in drinking water, and basins where surface water is used as a source of drinking water. These three components are described in detail below.

Shellfish

The Department of Health Office of Shellfish Programs conducts sanitary surveys (an evaluation of the concentrations, sources, and environmental influences on pollution) of commercial shellfish growing areas in Washington. The information is used to classify growing areas into four categories:

1. **Approved** – This classification authorizes the growing or harvesting of shellfish for direct marketing. A growing area may be classified as Approved when pollution

source evaluations and the bacteriological water quality data show that fecal material, pathogenic microorganisms, and poisonous or deleterious substances are not present in dangerous concentrations.

2. **Conditionally approved** – A growing area that meets Approved criteria except for a predictable period may be classified as Conditionally Approved. The period is based on established performance standards specified in a management plan. For example, a predictable pollution event, such as a predetermined amount of rainfall in 24 hours, results in the temporary closure of the Conditionally Approved growing area.
3. **Restricted** – If the bacteriological water quality of a commercial growing area does not meet the standard for an Approved classification, but the sanitary survey indicates only a limited degree of pollution, the area may be classified as Restricted. Shellfish harvested from Restricted growing areas cannot be marketed directly, but must be relayed to an Approved growing area for natural biological cleansing. Restricted classifications are only considered where levels of fecal pollution or poisonous or deleterious substances are low enough that relaying will purify the shellfish prior to marketing.
4. **Prohibited** – A growing area may be classified as Prohibited when information indicates that fecal material, pathogenic microorganisms, marine biotoxins, and poisonous or deleterious substances may be present in dangerous concentrations. Marine waters adjacent to sewage treatment plant outfalls and other persistent or unpredictable pollution sources are classified as Prohibited. Commercial harvests of shellfish are not allowed from Prohibited areas.

The Department of Health also conducts water quality studies throughout the year in all active commercial shellfish growing areas. When water quality in a growing area is found to be deteriorating, the area is considered “threatened”, indicating that it is at risk of moving into a lower classification. The list of Threatened growing areas is updated yearly. The UWA Threatened Basins are those with growing areas that the Department of Health currently considers to be threatened.

The UWA Impaired Basins have growing areas the Department of Health has downgraded, i.e., where harvest restrictions are in place due to impaired water quality. This includes any basin containing a growing area in a classification other than Approved.

There are several ways a basin can appear as both threatened and impaired. A growing area may have been downgraded and be threatened with further downgrade. A bay may also contain several different growing areas, with the different areas having different status.

This information layer, of course, applies only to certain WRIAs on the west side of the state. We have not included areas that are always closed due to the proximity of a sewer

outfall. Neither have we included recreational harvest areas. For these reasons, we have not identified "healthy" WRIsAs for this information layer.

Table 7.10
Shellfish Status by WRIA

WRIA #	UWA Threatened	UWA Impaired
1	Drayton Harbor	Drayton Harbor
1	Portage Bay	Portage Bay
1	Samish Bay	
3	Samish Bay	S. Skagit Bay
3		N. Skagit Bay
5		Port Susan
11	Nisqually	Nisqually Reach
13	Henderson Inlet	S. Henderson Inlet
13		S. Eld Inlet
14	North Bay	North Bay
14	Lynch Cove S. Shore	S. Eld Inlet
14		Lower Hood Canal
15	Lemolo (Liberty Bay)	North Bay
15	North Bay	Burley Lagoon
15	Tahuya	Minter Bay
15	Dutcher Cove (Case Inlet)	Liberty Bay
15	Filuchy Bay	Port Gamble
15	Henderson Bay	Lower Hood Canal
15		Rocky Bay
16		Dosewallips Delta
16		Duckabush Delta
16		Lilliwaup
17		Quilcene Bay
18	Dungeness Bay	
24	Bay Center	Bay Center
24	Naselle	

Surface Drinking Water Sources

This sub-layer identifies basins that contain sources for larger public drinking water systems where surface water represents a significant portion of the system's total capacity. The vulnerability of surface water to contamination and the potential impact on human health make these basins important areas for protection and preservation. Therefore, basins in this information sub-layer are all considered Healthy for the purposes of this document. This category was selected because of the desire to emphasize the importance of protecting and preserving watersheds that are significantly relied upon for drinking water.

Data for this layer was compiled from the Department of Health's Drinking Water Database

(downloaded on July 28, 1999). The data set that was used included all Group A water systems, as defined by the federal Safe Drinking Water Act, reporting total connections equal to or greater than one thousand connections. This data set was further screened for systems using surface water sources as permanent or seasonal supplies that represent at least 25 percent of the system's permanent and seasonal capacity. Drinking water sources are categorized as permanent, seasonal, or emergency.

1 – Whatcom	10 – Puyallup/White	26 – Lewis
2 – San Juan	11 – Nisqually	29 – Wind/White Salmon
3 – Lower Skagit	15 – Kitsap	31 – Rock/Glade
7 – Snohomish	17 – Quilcene/Snow	32 – Walla Walla
8 – Cedar/Sammamish	22 – Lower Chehalis	36 – Esquazel/Coulee
9 – Duwamish/Green	23 – Upper Chehalis	37 – Lower Yakima
	24 – Willapa	47 – Chelan

Nitrates in Drinking Water

This sub-layer identifies basins with concerns related to nitrates in drinking water. It includes basins where five percent or more of the approved drinking water sources have submitted sample results to the Department of Health indicating nitrate concentrations greater than or equal to five milligrams per liter. This concentration was selected because it is the trigger above which a public water system must conduct quarterly samplings due to concerns about potential health effects. The threshold of five percent was selected to ensure that the screen captured all areas where nitrate concentrations indicate a potentially significant impairment. Note that nitrate contamination is primarily a concern related to shallow aquifers. These relatively shallow aquifers are used more predominately by smaller water systems. The data set used included sources from larger water systems that are likely to have multiple wells using deeper aquifers. It is expected that the percent of sources indicating nitrate contamination will be very small. Therefore, a relatively low threshold was selected. All basins on this sub-layer are considered impaired.

Data for this layer was compiled from the State Department of Health's Drinking Water Database. All public water supplies regulated by Health are required to sample their source for nitrates at least once every 36 months. For this reason data were analyzed for the period from June 1996 through June 1999. The data set that was used included all Group A and Group B water systems, as defined by the federal Safe Drinking Water Act.

1 – Nooksack	36 – Esquazel Coulee	50 – Foster
31 – Rock/Glade	37 – Lower Yakima	53 – Lower Lake Roosevelt
32 – Walla Walla	41 – Lower Crab	54 – Lower Spokane
33 – Lower Snake	42 – Grand Coulee	55 – Little Spokane
34 – Palouse	43 – Upper Crab/Wilson	56 – Hangman
	44 – Moses Coulee	58 – Middle Lake Roosevelt

The Fish Layer

The fish layer is based on the January 1999 Draft Statewide Strategy to Recover Salmon – Extinction is Not an Option.

A model is presented in that draft that uses the Salmon and Steelhead Stock Inventory (SASSI) and Endangered Species Act (ESA) listing data as a screening tool to develop a ranking of all 62 WRIsAs on the basis of their healthy and unhealthy salmonid stocks. Point values and totals were calculated based on critical, depressed, healthy, or unknown stock status for salmonids in each WRIA and on the presence of salmonid species listed or proposed for listing as threatened or endangered under ESA. Evaluated stocks include chinook, chum, coho, pink, sockeye, steelhead, bull trout, and cutthroat trout/dolly varden.

UWA threatened basins are those that rank high in both healthy and unhealthy stocks (“high” is defined as least healthy 25). UWA impaired basins are those that rank high in unhealthy stocks (i.e., top 25), and low in healthy stocks (i.e., #26 and below).

Table 7.11
Fish Status by WRIA

<u>Impaired Basins</u>		
<i>High unhealthy stocks/low healthy stocks</i>		
WRIA #	Rank unhealthy	Rank healthy
26	3	26
35	9	35
28	12	30
29	16	28
38	18	40
46	22	36
39	23	44
30	24	29

<u>Threatened Basins</u>		
<i>High unhealthy stocks/high healthy stocks</i>		
WRIA #	Rank unhealthy	Rank healthy
25	1	22
18	2	18
48	4	25
45	5	16
27	6	20
3	7	7
17	8	21
16	10	6
1	11	17
15	13	4
21	14	2
20	15	1
8	17	23
5	19	12
7	20	5
37	21	24
11	25	10

Of course, there are many opportunities for both restoration and preservation work for fish other than salmonids. However, because the UWA is aimed at increasing cooperation in watershed activities and resources, and because most of the fish-centered activities and resources in Washington in 1999 are focused on salmonids, we have based this layer on the work of the Governor's Salmon Recovery Office. The workgroup may consider expanding the fish layer in the future to address other issues.

Watershed Restoration Action Strategies

The next second step in the UWA federal guidance directs states to develop Watershed Restoration Action Strategies (WRASs) for the high priority watersheds. The purpose of these strategies is to assure that UWA funds are effectively targeted. Ecology, NRCS, and US Forest Service are accountable to EPA to show that funds associated with the UWA are targeted to documented issues in the "high priority" watersheds.

The Watershed Restoration Action Strategy Approach for Washington

The information matrix can provide a foundation for collaboration among the resource managers when used to make decisions about directing watershed resources. Although we may use it in a variety of different ways to help us establish priorities, it gives us a common starting point. At a coarse level, it can help us see where work may need to be done, identify geographic areas of common interest, and identify opportunities to coordinate our activities with each other and with local interests and efforts. As we work with the information matrix, we can continue in the future to develop and refine it to better suit our needs.

Coordination is a key aspect of Washington's UWA. In 1999, at least \$143 million was spent on watershed efforts, salmon restoration, and nonpoint source control. Identifying critical areas and their lead agencies through the UWA would greatly increase coordination and effectiveness. An interagency agreement may provide the basis for coordination. The Governor's Joint Natural Resource Cabinet is expected to support the approach and help with coordination.

However, for watershed management and restoration to be successfully implemented, a local government must provide certainty through a regulatory implementation strategy including the development of land use designations through zoning, critical area protection, and capital facilities infrastructure funding.

Three elements interrelate to create a phased approach to restoration action strategies for Washington's watersheds:

1. Local watershed efforts already in place
2. The update of Washington's Nonpoint Source Management Plan
3. Local efforts being coordinated and funded under Washington's Watershed Management Act and Salmon Recovery Act

The Elements

- 1) A lot of watershed assessment, planning, and implementation has been done in Washington at the local level. These efforts are often tied to regulatory responsibilities, technical assistance, and/or funding sources administered by State and federal agencies. This local work is the foundation of the restoration action strategies. The matrix on the next page lists principle restoration plans already in place for sample watersheds.

This first element/phase of Washington's Watershed Restoration Action Strategy was submitted to EPA in draft form in May 1999.

- 2) The Nonpoint Source Management Plan for Washington will provide the second element of our WRASs – the statewide, programmatic view. Appendix 1 of the plan characterizes each watershed using land use, demographics, 303d and TMDLs completed, principal causes and sources of problems, critical areas, and existing water quality programs in place. Projects funded by incremental funds must address problems identified in this characterization and included in the completed management plan. In addition, the Plan will discuss how the agencies are working together on long-term development of our Unified Watershed Assessment, the related opportunities for coordinating programmatic activities, and the responsibility each has as an implementation partner.
- 3) The third element of WRASs in Washington is more long term and encompassing. It is based on current major watershed efforts through the Watershed Management Act (WMA) and Salmon Recovery Act (SMA). See full description of these acts in Chapter 3. Together these two processes are long-term watershed planning in Washington. Both rely on local governments assuming responsibility for planning and action. Both bring together various levels of government, Tribes, conservation or special districts, nonprofit groups, citizens, and other interests. Both are funded through the State legislature. These are big efforts. They involve a major commitment from State agencies, local and tribal governments, the State legislature, and other groups.

Watershed recovery efforts through either a WMA planning unit or SRA committee or both are underway in all but four of the WRIAs considered as high priority in this document. As the accompanying matrix demonstrates, all the high priority WRIAs have other major recovery efforts underway. In addition, the Governor's Salmon Team is pursuing a statewide salmon recovery strategy that will address many of the relevant issues.

The following information demonstrates the level of restoration planning completed or underway in selected WRIAs across the state.

Table 7.12
Existing Restoration Plans in Selected WRIAs in Washington

Example WRIAs	WMA 2514	SRA 2496	P.S. Watershed Action Plan	Approved TMDL**	Watershed Analysis	WQ Plan of Action	Lake Restoration Plan
#1 Nooksack	X	X	Kamm Creek Silver Creek Drayton Harbor Sammish Bay Tenmile Creek	Sumas River	Acme Lake Watcom Hutchison Ck Porter Canyon Skookum Ck Warnick		Whatcom Lake
#3 Lower Skagit/ Samish	X	X	Nookachamps Sammish Bay Sammish River Padilla Bay/ Bay View Lower Skagit	Erie Lake Campbell Lake	Hansen Ck	Skagit/ Stillaguamish Watershed	Big Lake Ketchum Lake Erie Lake
#5 Stillaguamish			Stillaguamish		Deer Ck Hazel	Skagit/ Stillaguamish Watershed	Ki Lake Lake Martha
#7 Snohomish			North Creek French Creek Quilceda/Allen	Snohomish River Snoqualmie River (x3)	Tolt River Woods Ck Griffin Ck Tokul Ck	Island/ Snohomish Watershed	Blackmans Lake Crabapple Lake Goodwin Lake Howard Lake Loma Lake Martha Lake Roesiger Lake Shoecraft Lake Stevens Lake Sawyer Lake
#10 Puyallup/ White		X	Lower Puyallup Chambers/ Clover Burley /Minter Upper Puyallup	Commence- ment Bay Puyallup River (x2) Boise Creek	Clearwater/ Mid. White	South Puget Sound Watershed	Snake Lake
#16 Skokomish/ Dosewallips	X	X			-Skokomish, S.F.		
#17 Quilcene/ Snow	X	X	Port Ludlow Discovery Bay Sequim Bay Quilcene/ Dabob		Big Quilcene		
#18 Elwah/ Dungeness	X	X	Dungeness River Area Port Angeles Urban Wshed	Strait of Juan de Fuca			
#22 Lower Chehalis	X		Chehalis River Basis Action Plan for the Identification	Grays Harbor Wildcat Creek	Wynoochee		Duck Lake

			and Control of Non Point Pollution				
#29 Wind/ White Salmon		X	White Salmon		Panakanic		
#32 Walla Walla		X		Mill Creek	Wolf F./ Robinette		
#37 Lower Yakima	X		Yakima River	Yakima River (x2)	Darland Foundation		Griffin Lake
#41 Lower Crab			Weber Coulee MidColumbia Watershed Planning	BOR Wasteways			Moses Lake
#47 Chelan			Lake Chelan	Lake Chelan			

Additional Restoration Plans -- same Selected SampleWRIAs

Example WRIAs	PL 566 Projects	EQIP GPAs	Shellfish Closure Response Plan	Coordinated Water System Plans	Groundwater Management Areas	Other Plans
#1 Nooksack	Tenmile Ck	North Puget Sound	Portage Bay Drayton Harbor	Whatcom County		S.Fork Sediment Reduction Plan N.Fork Sediment Reduction Plan Middle Fork Sediment Reduction Plan
#3 Lower Skagit/ Samish		North Puget Sound	Samish Bay	Skagit County		Skagit Cnty Watershed Ranking
#5 Stillaguamish		North Puget Sound		North Snohomish County	West Snohomish	Watershed Assessment and Salmonid Habitat Restoration Strategy for Deer Creek
#7 Snohomish		North Puget Sound		North Snohomish County East King County	West Snohomish Redmond/Bear Creek E. King County Issaquah Ck Valley S. King County	Animal Waste Management Plan for the Snohomish River
#10 Puyallup/ White				Pierce County		White River Culvert Assessment Project
#16		North	Lilliwaup Bay			Mason County

Skokomish/ Dosewallips		Puget Sound				Watershed Ranking Project
#17 Quilcene/ Snow		North Puget Sound		Jefferson County		Clallam Landscape Management Plan
#18 Elwah/ Dungeness		North Puget Sound				Clallam Landscape Management Plan Dungeness/ Quilcene Water Resources Mngt Plan
#22 Lower Chehalis						Chehalis River Basin Fisheries Resources: Status, Trends and Restoration Goals
#29 Wind/ White Salmon						
#32 Walla Walla		Blue Mountai n				Walla Walla Watershed Restoration Project
#37 Lower Yakima	Moxee Creek	Lower Yakima River				Spring Creek Watershed Project
#41 Lower Crab		Lind Coulee Columbi a Basin		Grant County (Quincy Sub-basin)	Columbia Basin	
#47 Chelan		Chelan				

** In addition to the completed TMDLs listed, 24 TMDLs are under development in the high priority WRIAs listed on the matrix.

Implementation of Watershed Restoration Action Plans

Washington will rely on the commitment of agencies and the three elements mentioned above, to coordinate the development of watershed restoration action strategies. The information matrix established in the UWA will first show where the primary water related concerns are in the State. This tool continues to be refined, but is very usable in its current configuration.

Agencies will be asked to use this information to identify areas of the State where they intend to target resources in the coming years. An example might be shellfish restoration. We have identified WRIAs (or parts of WRIAs) that Health intends to focus on, due to threats of downgrades or implementation of restoration activities. This will not be as clear for other agencies. The intent is to work in this fashion to determine agency priorities based on a common base of information made available to all.

Once agencies have identified their priority areas, a process will be designed to promote coordination, first between agencies, and then with local interests. Where common interests have been identified, agencies will commit to approach local interests to determine specific needs and identify common concerns that can be addressed in a comprehensive manner. This evaluation will result in a plan of action for the area, which constitutes the Watershed Restoration Action Strategy.

In many cases, local efforts at broad scale planning are already underway. These planning and implementation groups will provide the forum for coordination with agencies. Local efforts will rely heavily on existing studies, at least to start. In the future, more broad-spectrum evaluations of WRIAs will provide a clearer understanding of watershed processes and indicate where restoration and prevention resources need to be targeted.

Chapter 8

Goals and Objectives

The mission of water quality efforts in Washington State is to provide cool, clean water for all needs. Fish, shellfish, wildlife, human life, and domestic animals rely on an abundance of clean water for sustenance and enjoyment. Irrigation and other industrial systems need abundant clean water for efficient operation. This resource is the historical legacy of Washington, the Evergreen State.

In developing this chapter, the goal statement lays the foundation for future actions and the philosophic intent for controlling nonpoint source pollution. From it, a series of objectives, and ultimately direct actions were born. The sequence looks like this:

- Goal** - This is the general, philosophic, best-of-all-worlds statement that expresses an intent. The goal statement was developed through discussion with the various entities who helped develop this plan.
↓
- Objectives** - These represent the tools and approaches used to fulfill the goal.
↓
The objectives were developed, reviewed, and approved by the implementing agencies and others.
- Activities** - These are the day-to-day events involved in the development and implementation of this plan. They include ongoing programs and new ideas for improving program effectiveness. Each new or upgraded activity identified in this plan was generated through lively discussion and ultimately agreed to by the implementing entity.

Each new activity found in the implementation strategy (Chapter 9) is shown as implementing one of the objectives listed below.

Goal

Using a whole systems approach, the goal of this plan is to protect and improve water quality to State standards by reducing and preventing nonpoint source pollution through enforcement of existing programs, development of innovative and sustainable approaches, and implementation of the management measures identified in this plan.

Objectives

The objectives are not in priority order.

1. Maintain, enhance, or establish working relationships with federal, State, tribal, local agencies, stakeholders, and other non-governmental organizations.
2. Develop innovative tools for nonpoint source pollution prevention and control.
3. Provide financial assistance to tribes and local entities.
4. Implement and enforce existing nonpoint programs for all agencies in Washington State.
5. Increase educational efforts, particularly related to sustainability.
6. Increase knowledge about the causes and effects of nonpoint source pollution.
7. Address nonpoint problems at strategic (statewide) and local (watershed) levels.
8. Help people protect and improve their private landscapes by promoting water quality problem-solving at the local level.
9. Monitor efforts and water quality improvements.
10. Focus efforts to address priority water quality problems and threats.

Key Components of the Strategy

The key components of this strategy build on the objectives. The objectives were developed through the following understandings:

Working Relationships - Key agencies and groups overseeing projects related to nonpoint pollution will be encouraged to share results, issues and other pertinent information. This may be done through e-mail, reports, workshops or other meetings focused on information sharing.

Innovative Tools - Selected agencies will gather information and prepare a variety of turn-key approaches to solving water quality problems. Referred to as "effective approaches," each will focus on a major, common nonpoint source water quality issue and provide local decision makers and activists with information needed to successfully deal with a specific water quality problem. Effective approaches are needed for agricultural BMPs, incentives, funding sources, riparian protection and habitat enhancement, septic systems, small town stormwater alternatives, dairies, feedlots, agricultural erosion control, nutrient loading from agriculture, marina pumpouts, etc.

Financial Assistance - Agencies will be encouraged to streamline their financial assistance programs to provide equitable and reliable funding to nonpoint efforts. As a first step, agencies

should combine grant funding sources to eliminate the duplication of efforts on the part of project proponents.

Enforcement - Agencies will be encouraged to use their enforcement capabilities in a more effective fashion. High priority will go to those enforcement actions which complement other activities to manage nonpoint pollution, including parallel enforcement actions, especially where violation can clearly be attributed to a specific operation or individual.

Environmental Education - Environmental education about nonpoint sources of pollution is a vital tool to prevent pollution before it happens. Developing educational programs, increasing public understanding about pollution, and promoting volunteerism are ways this important element can be achieved.

Scientific Knowledge - Nonpoint source pollution, by its very nature, is not very well understood. In most cases, specific causes cannot be pinpointed. Nonpoint sources of pollution should be understood as a system-wide issue. The need to increase understanding through scientific knowledge and increased monitoring is essential to solving the nonpoint source problem.

Local Problem Solving - The best solutions are often developed by the people closest to the problem. Since most nonpoint pollution is caused by land uses at the local level, locals are the best ones to solve most water quality problems, with assistance from federal and State agencies.

Cooperation for Results

The complexities of Washington State government and the differing authorities of the several agencies responsible for controlling nonpoint source pollution have made cooperative efforts burdensome. Staff time is usually at a premium and efforts to participate with other agencies are often a low priority. However, the need to share resources, efforts, and programs is recognized as essential. Therefore, a communication strategy was developed to help create working partnerships and linkages with appropriate state, tribal, regional, and local entities. The first part of this chapter will discuss the work groups that helped develop this strategy. The second part will discuss the outreach and public review process.

Workgroups

Six different groups had a key role in developing this plan:

State Agency Workgroup was made up of representatives from various State agencies with authority and responsibility for managing nonpoint sources of pollution: Parks, Health, Agriculture, Transportation, Fish and Wildlife, Natural Resources, and Ecology; the Interagency Committee for Outdoor Recreation; Conservation Commission, Washington State University Cooperative Extension, and the Puget Sound Action Team.

Tribal Water Quality Managers included water quality staff from several of Washington's 26 Indian tribes. In addition, staff from the Northwest Indian Fisheries Commission were represented through the Coordinated Tribal Water Quality Program.

Water Quality Partnership, a permanent advisory group to Ecology's Water Quality Program. The partnership advises the program on a wide range of water quality issues facing the State. It consists of federal, State, tribal, industry, environmentalist, and other external stakeholders. They meet several times a year, and have reviewed this plan.

Unified Watershed Assessment (UWA) Workgroup – Following federal guidance, the workgroup has completed a Phase I Unified Watershed Assessment and has currently upgraded the Phase II approach. The UWA and its associated Watershed Restoration Action Strategy are an integral part of this plan, pointing the way toward better coordination of efforts and funding.

Ecology's Water Quality Program Steering Committee - section heads and unit leaders within Ecology's Water Quality Program. The group represents regional and headquarters supervisors engaged in a variety of programs and activities aimed at controlling nonpoint sources of pollution. The role of this group was to develop a Water Quality Program nonpoint strategy and to guide the planning process for this document.

Ecology's Nonpoint Source Workgroup - representatives of the various programs within Ecology (Water Resources, Spill Prevention, Toxics Cleanup, Air Quality, Solid Waste, Hazardous Waste and Toxic Reduction, Environmental Assessment, Shoreland and Environmental Assistance, and Water Quality). A number of these programs have authority and responsibility for managing a nonpoint source of pollution.

In addition to these workgroups, outreach and advice were sought from NRCS, USFS, agricultural commodity groups, Washington Association of Cities and Counties, Environmental groups, Washington Forest Protection Association, and numerous others organizations. Formal consultation with federal agencies will occur in 2000 and following years. See Chapter 10 for a full discussion of federal consistency requirements.

The Role of the Workgroups in Developing this Plan

Each work group had a different role. An initial meeting introduced the need for the water quality strategy, the federal requirements, the benefits of developing the strategy, and the expected role of each group. Meetings were kept to a minimum. Coordination and communication happened through one-on-one conversations, phone calls, and electronic mail.

A standard set of questions was asked each member of each group. The interviews brought to light program redundancies, problems, complexities, and eventually an analysis of management gaps.

The questions were:

What nonpoint source management activities/programs is your agency, tribe, or program engaged in?

This flushed out the broad range of programs and activities in Washington State.

What successes have been achieved, or, if there are continual or recurring problems, in your opinion, why do they still exist?

This was an attempt to understand why water quality in the State is not improving, given the successes of so many well-implemented programs.

What additional nonpoint source control mechanisms need to be addressed? What can your agency do to address them?

This was an opportunity for new ideas to be generated that would become part of the "New Recommendations" in Chapter 9.

In addition, the findings from the standard interview questions were used to identify agency responsibility, program analysis, and management gaps, forming the basis for the "Management Measures" chapter. The full range of programs and approaches to managing nonpoint source pollution was amazing.

Communication Strategy

(please note schedules and time frames for final approval are estimates)

Early in the process of creating the nonpoint management plan, a communication strategy was developed to direct the approach of working with partners, purpose of meetings, expected outcomes, and timeframe. This strategy was followed closely. A Gantt Chart was also used to outline very specific steps and dates in the overall development of the management plan. The chart identified times for information gathering and the ultimate drafting of each chapter of the plan. Timeframes for review and management briefings were also charted.

In May of 1999, the first draft was circulated to the various contributors to the plan. Our intention was twofold: to make sure program descriptions, gaps, and recommended actions were accurately described; and to identify linkages and opportunities for improving management before the public review draft. This gave us additional time to coordinate between entities and iron out some wrinkles before involving a broader audience. EPA and NOAA were also provided copies so they could make preliminary comments.

This draft also was circulated to a number of key affected parties. Since it was impossible to involve everyone in the drafting of the plan, we felt at least we could provide an opportunity to comment while the plan was still flexible.

As drafting work drew to a close, a shorter abridged version of the plan was prepared. This document became the primary tool for reaching the public and other interested parties.

Ecology has a nonpoint mailing list of over 3000 entities representing diverse interests. The announcement of the draft plan was mailed to each in September 1999, giving timeframes for response and comment. In addition, an announcement was posted on Ecology's web site and copies of the draft plan and the abridged version were available through this site.

In October 1999, four public meetings were held, one in each region of the state: east, central, northwest, and southwest, in which the plan and strategy were discussed. These meetings encouraged dialogue on the strategy between agencies and the public. All comments were noted and changes to the plan were made as appropriate. Written input was also taken from those who were unable to attend the meetings. A response to comments was prepared.

During the review period, representatives of special interest groups such as agriculture and timber received one-on-one briefings. These meetings promoted a collaborative approach, which became the theme of the nonpoint management plan.

Chapter 9

Implementation Strategy

This plan's implementation strategy includes activities in two broad categories. The first are those programs that are currently being implemented in the state. This plan assumes that all existing programs will continue, at least for the term of this plan, which is 5 years. These programs are described in Chapter 5.

The second category includes all the recommended actions listed in the tables below. These represent either upgrades to existing programs or new program additions. In either case, these actions are designed to make the fundamental changes to the State's nonpoint program required by the Clean Water Act and Coastal Zone Act Reauthorization Amendments, or to meet other State objectives, such as restoring salmon runs.

Implementation actions are organized by Source Category identified in Chapter 6. In addition, each activity has been cross-referenced to show the objectives it is designed to address (see Chapter 8).

Where activities are related to a major initiative in Washington, this has been indicated. The appropriate management measure referenced in the CZARA guidance has also been identified where the action is intended to meet those requirements. The responsible organization for each activity have been listed with the lead agency underlined. A list of acronyms for each agency is found in the front of the plan.

A key facet to the State's nonpoint program is related to the development of Total Maximum Daily Loads to address nonpoint source pollution. A discussion of this approach and the State's commitments is included after the table of recommendations.

The end of the chapter includes discussion and recommendations for improving the nonpoint source enforcement and monitoring programs in the state. The last section outlines program development needs and recommendations.

Table 9.1
Actions to Manage Nonpoint Pollution in Washington State (1999 - 2004)

* Actions required by CZARA 6217 Lead agency is underlined

Obj #	Agriculture Activities Common Sources: loss of riparian areas, livestock manure, sediment	Responsible Organization	Action Status	Time-frame	Management Measure and/or Program Linkage
New Program Development					
2 - 5, 7 - 9	Ag 1*: Develop Statewide Irrigated Agriculture Comprehensive Plan to facilitate development of Comprehensive Irrigation District plans	WSDA, CC, ECY, WDFW, NRCS, tribes	New	2001	Ag IIA - IIF Salmon Strategy (Agr 1)
4, 8	Ag 2: Build capacity in conservation districts to better deliver water quality programs by providing permanent stable funding	Counties, CC, WACD	New	2004	Ag IIA - IIF
1, 2, 3, 6, 7, 8	Ag 3: Expand well water protection findings in order to prioritize technical support and compliance inspections. Support GWMA projects.	ECY, WDSA, CE	Upgrade	2004	Ag IIA-IIF Wellhead and Groundwater Protection
1, 2	Ag 4*: Update Field Office Technical Guide (FOTGs) for use by NRCS and CDs	WSDA, CC, CE, ECY, WDFW, WSDOT	New	2001	Ag IIA-IIF Salmon Strategy (Agr 4)
1, 6	Ag 5: Establish an MOA with NRCS to evaluate the effectiveness of Best Management Practices used in agriculture	ECY, NRCS	New	2001	CWA general requirement
6	Ag 6: Evaluate impacts of grazing on water quality in Washington	CC, ECY, CE, NRCS	New	2009	Ag IIE
3, 6, 8	Ag 7: Study feasibility of converting open gravity canals and other current delivery systems to more efficient systems, including pressurized pipe.	ECY	New	2009	Ag IIF
4, 5, 7	Ag 8*: Refine and update state restrictions on pesticide applications and provide technical assistance on proper use of pesticides to ensure compliance with the <i>Endangered Species</i> and <i>Clean Water Acts</i> , in both rural and urban areas.	WSDA, ECY, WDFW, DNR, WSDOT	Upgrade	2001	Salmon Recovery Strategy (Agr 1-revised)

4, 5, 6, 7	Ag 9: Secure a source of permanent and ongoing funding for the FARM*A*SYST/ HOME*A*SYST program within Washington State University.	WACD, <u>CE</u> , CC	Upgrade	2004	Ag IIC, IID National FARM*A*SYST/ HOME*A*SYST
5	Ag 10: Develop an education and outreach program targeted at small farms water quality and ESA compliance	ECY, <u>CE</u> , WACD, CC	Upgrade	2004	Ag IIA – IIF
Obj #	Agriculture Activities <i>Common Sources: loss of riparian areas, livestock manure, sediment</i>	Responsible Organization	Action Status	Time-frame	Management Measure and/or Program Linkage
New Incentive Programs					
4, 7, 8, 10	Ag 11*: Implement Conservation Reserve Enhancement Program	WSDA, <u>CC</u> , NRCS, FSA	New	2001	Salmon Strategy
3, 7	Ag 12*: Actively engage agricultural producer groups in developing and implementing new BMPs	<u>CC</u> , WSDA, CE, <u>ECY</u>	New	2004	Ag IIA, IIC, IID, IIF
5	Ag 13: Use SRF low-interest loans to help agricultural commodity groups with development and installation of BMPs that reduce pollution and water use.	<u>ECY</u>	Upgrade	2004	Ag IIA -IIF

**Table 9.1 cont.
Forestry Activities**

Obj #	Forestry Activities Common Sources: Forest roads, timber harvest, sediment, temperature	Responsible Organization	Action Status	Time-frame	Management Measure and/or Program Linkage
New Program Development					
1, 4	For 1*: Adopt and implement new forest practices rules consistent with the <i>Forest and Fish Report</i> and Chapter 247, Laws of 1999 (ESHB 2091)	Forest Practices Board, DNR, ECY, WDFW, WSDA, DCTED	New	2001	Salmon Strategy (For 1)
1, 8	For 2: Complete Habitat Conservation Plan on forestry module	WSDA, ECY, WDFW, DNR, SRO	New	2003	Salmon Strategy (For 3)
2, 6, 9	For 3: Update watershed analysis manual, facilitate conducting watershed analyses and approve watershed analysis permits	DNR, ECY, WDFW	Upgrade	2001	Salmon Strategy (For 5)
4, 7	For 4: Review and approve road maintenance and abandonment plans	DNR, WSDA, ECY, WDFW	New	2001	Salmon Strategy (For 2)
1, 8	For 5: Approve transfer of Class IV general forest practices permits to local governments	DNR, ECY, WDFW, DCTED	New	2001	Salmon Strategy (Lan 6)
1	For 6*: Finalize the MOA between USFS and Ecology to address water quality compliance and development of TMDLs	ECY, USFS	Upgrade	2004	
4, 8	For 7: Establish a state policy to allow timber leases for conservation purposes.	DNR	New	2004	
Small Forest Landowner Assistance					
5, 8	For 8: Carry out functions of the Small Forest Landowners' Office	DNR, ECY, WDFW	New	2001	Salmon Strategy (For 4)
5	For 9*: Educate small forest landowners on water quality and ESA issues, and new rules	DNR, ECY, NRCS, DFW, CE	Upgrade	2004	

Table 9.1 cont.
Urban Activities

Obj #	Urban Activities <i>Common Sources: stormwater runoff, failing on-site sewage systems, transportation facilities, heavy metals, fecal contamination, silt, petroleum and nutrients</i>	Responsible Organization	Action Status	Time-frame	Management Measure and/or Program Linkage
Development and Construction					
2, 4, 5, 8	Urb 1: Update guidelines and models for consideration by counties and cities on inclusion of Best Available Science and giving special consideration to salmon conservation in their local GMA Critical Areas Ordinances	WSDA, CC, <u>DCTED</u> , ECY, WDFW, DNR, PSWQAT, WSDOT, tribes	Upgrade	2001	Salmon Strategy (Lan 2)
4, 8	Urb 2: Revise guidance for development and implementation of local Floodplain Management Plans and for use of non-regulatory tools and incentives to reconnect rivers and flood plains	ECY, WDFW, , <u>DCTED</u> , WSDOT, EMD, PSWQAT	Upgrade	2001	Salmon Strategy (Lan 4, 5)
2, 5, 8	Urb 3: Design and promote incentives for non-regulatory land use protection programs.	<u>DCTED</u> , <u>ECY</u> , WDFW, WSDOT, DNR, PSWQAT,	New	2001	Salmon Strategy (Lan 8)
Stormwater Runoff					
3, 5, 7	Urb 4: Develop a Stormwater Management Strategy which includes updating the stormwater manual and helping local governments implement the manual to address stormwater impacts on habitat and water quality of new development	<u>ECY</u> , WDFW, PSWQAT, tribes, WSDOT	Upgrade	2001	Urban IIA, VIIA - VIIF Salmon Strategy (Sto 1, 2, 4)
5, 6, 8	Urb 5: Research stormwater technology design, cost benefit and know-how to effectively address stormwater problems	ECY, WDFW, tribes, PSWQAT, <u>WSDOT</u> ,	Upgrade	2001	Salmon Strategy (Rea 4)

3, 5, 7	Urb 6: Update the Puget Sound Stormwater Management Program and, as appropriate, update model ordinances for local stormwater management programs to be consistent with changes to the Puget Sound Management Plan	DCTED, ECY, WDFW, PSWQAT	Upgrade	2004	Salmon Strategy (Sto 3)
4, 9	Urb 7: Issue and reissue (on the regular five-year cycle) stormwater general NPDES permits. Provide technical assistance with implementation that conforms to the latest water quality standards and technical manual	ECY, WDFW, PSWQAT, WSDOT	Upgrade	2004	Salmon Strategy (Sto 5)
Stormwater Prevention					
2	Urb 8: Identify and participate in a zero impact stormwater demonstration project	ECY, DCTED, Counties, Cities, AGC	New	2004	Urban IIA
3, 4, 8	Urb 9: Expand the Urban and Community Forestry program to meet current requests for assistance from local governments, and perform adequate outreach.	DNR, Cities	Upgrade	2004	Urban IIA
3, 4, 8	Urb 10: Develop incentives for cities to participate in the TREE CITY, USA and other national programs encouraging urban forestry.	DNR, Cities	Upgrade	2004	Urban IIA
On-site Sewage Systems					
2, 4, 7, 9	Urb 11*: Identify needs to enhance the onsite O/M program at both state and local levels and recommend funding to implement.	DOH, PSWQAT	Upgrade	2004	Urban VB
3	Urb 12: Seek additional legal and financial assistance for local health officers' inspections of onsite sewage systems	DOH	Upgrade	2001	Urban VB
2	Urb 13: Identify and approve new technologies for onsite waste treatment	DOH	Upgrade	2004	Urban VA
5	Urb 14: Establish an effective statewide education program to convince the general public of the importance of properly maintaining their onsite sewage systems and how to do that.	DOH, Local Boards of Health	Upgrade	2004	Urban VB
1, 8	Urb 15: Expand the use of Memoranda of Agreement with local governments to address the needs for expansion of sewer services to areas of actual or projected high population density.	ECY, Counties	Upgrade	2009	

Urban Activities continued:

Obj #	Urban Activities <i>Common Sources: stormwater runoff, failing on-site sewage systems, transportation facilities, heavy metals, fecal contamination, silt, petroleum and nutrients</i>	Responsible Organization	Action Status	Time-frame	Management Measure and/or Program Linkage
Pollution Prevention					
2, 3, 7	Urb 16: Develop and implement a water restoration template for use in watershed plans under chapter 90.82 RCW	WSDA, CC, <u>ECY</u> , WDFW, DOH	New	2001	Clean Water Act
4	Urb 17: Implement spill prevention and response, hazardous waste and contaminated sediments programs to eliminate or reduce risks and impacts on aquatic systems	<u>ECY</u> , WDFW, DNR, WSDOT	New	2001	Salmon Strategy (Wqa 5)
	Urb 18: Through the Urban Pesticide Initiative, encourage the development and implementation of programs to reduce the use of pesticides in urban areas.	<u>EPA</u> , WSDA, CE, <u>ECY</u>	Upgrade	2001	
	Urb 19: Increase capacity within the state to re-refine motor oil.	<u>ECY</u>	New	2001	
Land Transportation Systems					
3, 4, 6, 7	Urb 20*: Provide road maintenance guidelines to local communities	<u>CRAB</u> , <u>WSDOT</u>	Upgrade	2004	Urban VIII
2, 5, 7	Urb 21: Complete the 20-year Washington Transportation Plan to include environmental sustainability	DCED, <u>ECY</u> , WDFW, <u>WSDOT</u> , PSWQAT,	Upgrade	2001	Salmon Strategy (Lan 10)
2, 7, 10	Urb 22: Completely reinvent NEPA pilot projects to address environmental concerns on a broad geographic area and earlier into project planning	<u>ECY</u> , WDFW, <u>WSDOT</u>	Upgrade	2001	Salmon Strategy (Lan 11)
3, 4	Urb 23: Revise and implement highway runoff manual; undertake stormwater retrofit for transportation projects; implement grant programs	<u>ECY</u> , WDFW, TIB, <u>WSDOT</u>	New	2001	Urban VIIC Salmon Strategy (Sto 6)
7, 9	Urb 24: Develop and implement a compliance/ accountability data base to track WSDOT permit requirements and mitigation activities.	<u>ECY</u> , WDFW, DNR, <u>WSDOT</u>	New	2001	Salmon Strategy (Enf 6)

Table 9.1 cont.
Recreational Activities

Obj #	Recreational Activities	Responsible Organization	Action Status	Time-frame	Management Measure and/or Program Linkage
General					
6, 9	Rec 1: Investigate impacts on water quality from recreational activities	<u>ECY</u>	New	2009	
2, 4, 9	Rec 2: Ensure grantees using funds for recreational facilities consider the adequacy of sewage and solid waste disposal facilities to be funded by the grant.	<u>DNR, Parks,</u> <u>WDFW</u>	Upgrade	2004	
Off-Road Vehicles					
3	Rec 3: Include water quality considerations in regular or required updates of grant funding policy plans.	<u>IAC</u>	Upgrade	2001	
Marinas and Boats					
3, 4, 5	Rec 4*: Evaluate the needs regarding the fuel dock education and assistance program	<u>WSG, ECY,</u> <u>NWMTA</u>	Upgrade	2004	Marina and Boats IIF
3, 4, 5	Rec 5: Examine new approaches to prevent spills from boaters overfilling their gas tanks.	<u>WSG, ECY,</u> <u>NWMTA,</u> <u>USCG</u>	Upgrade	2004	Marina and Boats IIF
2, 4, 7	Rec 6: Update the <u>Comprehensive Boat Sewage Management Plan for Washington State</u> .	<u>Parks</u>	Upgrade	2004	Marina and Boats IIG
5	Rec 7: Coordinate agency educational efforts for boaters on environmentally safe practices, such as for the Clean Boating Week held last year.	<u>ECY, Parks,</u> <u>WDFW,</u> <u>DNR, PSAT</u>	Upgrade	2004	Marinas and Boats IIIF
1, 7, 8	Rec 8: Facilitate the management and treatment of contaminated bilgewater at public and private marinas	<u>ECY,</u> <u>Counties</u>	Upgrade	2004	Marinas and Boats IIID
1, 7, 8	Rec 9: Develop additional policies and guidance on cleaning and maintenance practices by boaters	<u>ECY</u>	Upgrade	2004	Marinas and Boats IIIE
1, 7, 8	Rec 10: Promote household hazardous waste collection at marinas	<u>Counties</u>	Upgrade	2004	Marinas and Boats IIIC

**Table 9.1 cont.
Hydromodification Activities**

Obj #	Hydromodification <i>Common Sources: pH, metals, dissolved oxygen, nutrients, low flows</i>	Responsible Organization	Action Status	Time-frame	Management Measure and/or Program Linkage
1, 2, 3, 4, 5	Hyd 1: Develop and implement Integrated Stream Corridor Guidelines, building on the completed Integrated Streambank Protection Guidelines	WSDA, <u>ECY</u> , <u>WDFW</u> , <u>WSDOT</u>	New	2004*	Hydro IIB, IVA
4, 9	Hyd 2: Evaluate implementing the Hydraulics Code with an eye towards improving its use for water quality protection.	ECY, <u>WDFW</u>	New	2009	Hydro IIA, IVA
2, 3, 6	Hyd 3: Provide technical guidance and engineering support to help regional and watershed lead entities, local governments, tribes, private landowners and volunteers participate in salmon restoration projects, inventory and correct fish passage barriers, and implement screening in water diversions. Provide engineering support to instream and marine construction projects affecting salmon	CC, ECY, <u>WDFW</u> , DOH, IAC, <u>WSDOT</u>	Upgrade	2004	Salmon Strategy (Pas 4)

Table 9.1 cont.
Loss of Aquatic Ecosystems Activities

Obj. #	Loss of Aquatic Ecosystems	Responsible Organization	Action Status	Time-frame	Management Measure and/or Program Linkage
Program Development					
2, 5	LAE 1: Streamline the aquatic pesticide permitting process, including further incorporation of applicable requirements from the water quality standards to establish a permit by rule	<u>ECY</u>	Upgrade	2004	
7, 10	LAE 2: Coordinate restoration projects on a watershed basis to provide more effective results.	<u>CC, ECY, IAC, DNR</u>	Upgrade	2004	
1, 6, 8	LAE 3: Develop and provide critical information, technical guidance and maps to support local governments' update of their Critical Areas Ordinances	<u>DCTED, ECY, WDFW, DNR, tribes</u>	Upgrade	2004	Salmon Strategy (Lan 3)
5, 8	LAE 4: Prevent, control and monitor the spread of aquatic nuisance species	<u>WSDA, ECY WDFW, DNR, PSWQAT</u>	Upgrade	2004	Salmon Strategy (Lan 12)
2, 8, 9	LAE 5: Develop and implement a statewide lakes management program using the need identified on page 271	<u>ECY</u>	New	2004	
Ecosystem Programs					
3, 4	LAE 6: Implement, maintain, and update the Puget Sound Plan and biennial work plans for the Puget Sound Basin	<u>PSWQAT</u>	Upgrade	2001	Salmon Strategy (Lan 9 - revised)
3, 4	LAE 7: Implement the Statewide Wetlands Integration Strategy and the Puget Sound Wetland Restoration Program	<u>ECY, WSDOT PSWQAT,</u>	Upgrade	2009	W&R IIA-IIB
9	LAE 8: Implement statewide alternative mitigation [for wetlands] policy guidance and track case studies applying the policy	<u>ECY, WDFW, PSWQAT, WSDOT</u>	Upgrade	2004	Salmon Strategy (Lan 7)

1, 9	LAE 9: Continue to emphasize lake and watershed management planning to address nutrient and sediment enrichment, and de-emphasize the use of chemicals for pest control	ECY, WDSA	Upgrade	2004	W&R IIA, IIB CWA Requirement
2	LAE 10: Develop template for 5-yr mosquito control plans	ECY	New	2004	
3	LAE 11: Examine additional funding needs for mosquito control	ECY, DOH	Upgrade	2004	
3	LAE 12: Develop and implement a comprehensive riparian enhancement program involving JFE, WCC and other youth employment organizations.	ECY, DNR, USFS	Upgrade	2004	W & R IIB
3, 4	LAE 13: Implement Washington Conservation Corps "Salmon Recovery Initiative"	CC, ECY, WDFW, DNR	New	2001	Salmon Strategy (Edu 4)

Table 9.1 cont.
Educational Activities

Obj #	Educational Activities <i>Education is essential to public involvement in the successful reduction of nonpoint</i>	Responsible Organization	Action Status	Time-frame	Management Measure and/or Program Linkage
Program Development					
3	Ed 1: Develop a resource library of high quality educational materials to assist communities with nonpoint source issues.	ECY, PSAT, GCEE	New	2004	
5	Ed 2: Distribute or provide easy access to information on funding sources for salmon recovery and on funds expended on salmon recovery efforts	DCTED, ECY, WDFW, IAC, TIB, WSDOT	New	2001	Salmon Strategy (Edu 7)
5	Ed 3: Implement the H ₂ O Home to Ocean program similar to a program currently in California, which educates the public about wise use and proper disposal of pesticides.	WSDA	New	2004	Urban VI
5	Ed 4: Organize a biennial conference on nonpoint pollution for implementing agencies and groups as well as the general public	ECY	Upgrade	2000	
5,10	Ed 5: Develop and implement site-specific public education plans, for example, for parks with significant salmon resources and for hatcheries as Salmon Environmental Learning Centers	WDFW, DNR, Parks	New	2001	Salmon Strategy (Edu 5)
Programs for Schools					
5	Ed 6: Conduct a series of watershed-specific PROJECT WET teacher workshops on Watersheds for People and Salmon, focusing on pollution prevention, water conservation, habitat, and public health.	ECY, WDFW, local gov't facilitators	New	2004	
5	Ed 7: Complete Columbia Watershed curriculum for youth and adults, for better understanding and stewardship in the Columbia Basin	GCEE, ECY, WDFW, DNR, DOH, tribes	Upgrade	2000	
4, 5	Ed 8: Expand "Magic Apple" grants to fund exemplary teachers' water quality class projects	ECY	Upgrade	2004	
2, 5	Ed 9: Sponsor one new community Water Festival per year, for 4 th graders	ECY with local agency	Upgrade	2004	

Educational Activities continued

Obj #	Educational Activities <i>Education is essential to public involvement in the successful reduction of nonpoint</i>	Responsible Organization	Action Status	Time-frame	Management Measure and/or Program Linkage
Public Education Programs					
3, 5	Ed 10: Manage the Puget Sound Public Involvement and Education "PIE" fund program to develop innovative education programs	PSAT	Upgrade	2001	
4, 5	Ed 11: Fund small water quality education grants statewide	ECY	New	2004	
3, 5	Ed 12: Develop and implement statewide training programs for the public and specific interest groups such as teachers, contracting construction community and others	CE, <u>ECY</u> , <u>WDFW</u> , <u>GCEE</u> , <u>TIB</u> , <u>WSDOT</u>	Upgrade	2004	Salmon Strategy (Edu 6)
5	Ed 13: Develop and disseminate using external communication tools educational materials, brochures, fact sheets, and other items, information on salmon needs, status, stress factors, [water quality issues], and actions being taken and/or needed to assist the public in understanding salmon issues and solutions and how they can help	<u>WSDA</u> , <u>CC</u> , <u>ECY</u> , <u>WDFW</u> , <u>GCEE</u> , <u>DIS</u> , <u>DNR</u> , <u>SRO</u> , <u>WSDOT</u> , tribes	New	2004	Salmon Strategy (Edu 2)
Volunteer Programs					
2, 5, 7	Ed 14: Introduce and support Master Watershed Steward programs throughout the state	<u>GCEE</u> , <u>CE</u>	Upgrade	2004	
5	Ed 15: Develop and implement education/outreach and volunteers strategy	<u>GCEE</u> , <u>ECY</u> , <u>WDFW</u> , <u>IAC</u> , <u>Parks</u> , <u>PSAT</u> , <u>SRO</u> , tribes	Upgrade	2001	Salmon Strategy (Edu 1)
4, 6, 7	Ed 16: Support Watch over Washington's website for volunteer monitors and provide technical help to local groups and classrooms.	<u>ECY</u>	Upgrade	2004	
5	Ed 17: Train, direct, and equip volunteer monitors	<u>CE</u> , <u>ECY</u> , <u>WDFW</u>	Upgrade	2004	

6, 9	Ed 18: Establish an online, central repository for volunteers' data of known quality		DNR, WSDOT <u>ECY</u>	New	2009				

Table 9.1
General Needs

Obj #	General Activities <i>Programs that have multiple impacts or are administrative in nature</i>	Responsible Agency	Action Status	Time-frame	Management Measure and/or Program Linkage
Program Development					
1, 3	Gen 1*: Implement the Unified Watershed Assessment process for focusing federal, state, and tribal resources in an effective manner	ECY, NRCS, USFS, Tribes	New	2004	Clean Water Action Plan: Unified Watershed Assessment
4, 7, 8	Gen 2: Expand the development of local watershed plans under chapters 75.46 & 90.82 RCW and other related acts	ECY, WDFW, SRO	Upgrade	2003	
1, 3, 4, 6, 7, 8	Gen 3*: Enhance the abilities of the Watershed Characterization Team to analyze the watersheds of the state and provide tools to others to do the same.	ECY, DOT, WDFW, DNR	Upgrade	2004	Urban IIB
7, 8	Gen 4*: Promote local watershed planning and implementation that address 303(d) listings and prevents further listings. Provide technical assistance	ECY, PSWQAT	Upgrade	2004	Clean Water Action Plan TMDLs
1, 3, 10	Gen 5: Develop and implement schedule for Water Cleanup Plans (TMDLs) focussing on watersheds with listed species first	CC, ECY, PSWQAT, tribes	Upgrade	2014	TMDLs, Salmon Strategy (Wqa 3)
1, 3, 6, 7	Gen 6: Develop a cooperative and comprehensive interstate ground water protection plan with state (Oregon and Idaho) and tribal governments.	ECY, Oregon, Idaho, Tribes	New	2004	
1	Gen 7*: Establish working agreements with various federal agencies to address Clean Water Act consistency requirements	ECY	New	2004	Clean Water Act
3, 7	Gen 8: Adopt revised Guidelines for Shoreline Master Programs, and assist local governments to modify their Shoreline Master Programs	ECY, PSWQAT, DCTED, DNR, WDFW, WSDA, WSDOT, tribes	Upgrade	2004	Various Management Measures in Urban, Recreation, Hydro-modification, and Loss of Aquatic Ecosystems

3, 6	Gen 9: Develop, adopt and implement standards for water quality and contaminated sediment	ECY, WDFW, PSWQAT, WSDOT, tribes	Upgrade	2009	Salmon Strategy (Wqa 1, 2)
3	Gen 10: Examine additional funding needs for DOH shellfish protection efforts	ECY, DOH	Upgrade	2004	
1, 4	Gen 11: Implement the Yakima River Sediment Reduction Plan	WSDA, CC, ECY	Upgrade	2004	TMDLs, Salmon Strategy (Wqa 4)
2, 7	Gen 12: Negotiate a "road map" to facilitate the integration of the requirements of the federal <i>Clean Water</i> and <i>Endangered Species Acts</i>	WSDA, ECY, WDFW, DNR, WSDOT, tribes	New	2001	Salmon Strategy (Wqa 6)
Community Assistance					
5	Gen 13: Establish an information base for local communities that describes funding sources and necessary requirements.	ECY, Gov Office	New	2004	
5, 8	Gen 14: Enhance local ability to address water quality complaints and information requests	ECY, PSWQAT	Upgrade	2009	
4, 5	Gen 15: Provide technical assistance and information regarding ESA compliance to communities	ECY, DFW	Upgrade	2004	
1	Gen 16: Develop a coordinated process to integrate local and watershed planning efforts into the state nonpoint plan.	ECY	Upgrade	2004	
Monitoring					
1, 9, 10	Gen 17: Expand the development of a coordinated monitoring framework to integrate and/or coordinate statewide, regional, watershed and project-specific monitoring systems	ECY, WDFW, DNR, PSWQAT, SRO	Upgrade	2003	Salmon Strategy (Mon 1)
9	Gen 18*: Expand ambient monitoring network in the state by 2% per year	ECY	Upgrade	2004	Coastal Zone Act
9	Gen 19*: Track primary water quality indicators (pH, Temp, DO and Turbidity) using number of exceedances approach	ECY	Upgrade	2004	President's Clean Water Action Plan

2, 9	Gen 20: Develop criteria and protocol to guide the use of monitoring in decision making including adaptive management when specifically committed to at the watershed, activity, and regional scales and ensure decisions include adaptive management and monitoring component consistent with protocol and criteria	ECY, WDFW, DNR, PSAT, <u>SRO</u> , WSDOT	New	2004	Salmon Strategy (Mon 2)
2, 9	Gen 21: Develop and implement implementation and effectiveness monitoring systems to be incorporated in all new salmon recovery activities and a percent of existing activities	WSDA, ECY, WDFW, <u>SRO</u> , tribes	New	2001	Salmon Strategy (Mon 3)
9	Gen 22: Recommend standard monitoring and data quality guidelines for salmon habitat projects	IAC, <u>ISP</u> , <u>SRO</u> , DNR, WDFW	New	2000	Salmon Strategy (Mon 5)
9	Gen 23*: Develop and implement a comprehensive marina and boater destination water quality monitoring program	ECY, Parks, Counties, NWMTA	New	2004	Marina and Boats IIB
7, 9, 10	Gen 24: Enhance statewide monitoring of rate of harvest, riparian zone management, etc. consistent with the Forest and Fish Report	DNR, ECY, WDFW, tribes	Upgrade	2001	Salmon Strategy (For 6)
1, 6, 9	Gen 25: In cooperation with IGWC and other state agencies, develop a statewide ambient ground water monitoring system	ECY, DOH, WSDOT, tribes, counties	New	2003	General need
Enforcement					
1	Gen 26: Establish and implement collaborative processes to increase coordination of compliance and enforcement activities among the regulatory natural resource agencies with joint or primary jurisdictional authorities with joint or primary jurisdictional authority	<u>ECY</u> , WDFW, DNR, tribes	New	2001	Salmon Strategy (Enf 1)
4	Gen 27: Fully implement marine detachments within WDFW Enforcement to increase visible enforcement presence on marine waters	<u>WDFW</u>	Upgrade	2001	Salmon Strategy (Enf 2)
4	Gen 28: Increase compliance and enforcement of the Hydraulic Code for habitat protection and increase compliance with fish passage and screening requirements	WSDA, CC, ECY, <u>WDFW</u>	Upgrade	2001	Salmon Strategy (Enf 3)

4	Gen 29: Increase compliance and enforcement activities for nonpoint pollution sources	WSDA, CC, ECY, PSAT	Upgrade	2001	Salmon Strategy (Enf 4)
2	Gen 30: Evaluate new ways to improve compliance on DOT construction projects	ECY, WSDOT	Upgrade	2009	

Implementation of Total Maximum Daily Loads (TMDLs) to Address Nonpoint Source Pollution

TMDLs for control of nonpoint pollution sources (NPS TMDLs) are designed to address water quality problems by systematically identifying sources of pollution and carrying out mutually agreeable solutions that correct the problem. They are used as one method for addressing water body pollution problems leading to Section 303(d) listings. The development of TMDLs for waters on this list is a mandatory requirement of the federal Clean Water Act. Like other TMDL activities, NPS TMDLs must meet some basic criteria.

Most larger watersheds contain a combination of point sources and nonpoint sources. The fundamental approach to addressing each situation will vary depending on the size and complexity of the problems. A combination of nonpoint source and point source control mechanisms should be integrated to meet overall goals as needed for the watershed.

Many factors used to develop a point source TMDL are different from those used to develop a NPS TMDL. Point source TMDLs involve input parameters that are generally better known, quantifiable and controllable. The assimilation capacity of the water body for one or more pollutants is generally modeled, and the water quality improvement is reasonably predicted. The discharge limits are regulated by permit.

Sources of NPS pollution are rarely well defined. A NPS TMDL involves evaluation, source identification, planning, public involvement, and monitoring which may include a wide array of participants. NPS TMDLs are based on the assumption that designed management approaches will produce the desired water quality goals.

Progress is regularly checked against interim targets identified in a planning effort. Often, the true effectiveness of management approaches is not known until programs are implemented. Thus, new programs are developed, tested and refined as workable solutions are identified. Through time, new science and adaptive management will result in better understanding of the interactions in the aquatic environment.

The process of TMDL development allows for progressively more stringent requirements to be "phased in" over time as needed to meet the water quality goals. This allows locally-driven non-regulatory programs a chance to be successful before more restrictive measures are applied. The adequacy of NPS management activities is monitored over time to determine if implementation is effective in meeting the targets.

Determining the amount of pollutant loads contributed from wide areas within a watershed is often not an effective measure of need. The concept of loading capacity is rarely used because of limited research and the need to use broad assumptions. Instead, the process relies heavily on the development of targets or identifying a desired future condition for the water body. These targets must meet water quality standards at a minimum. They may also be based on a biological measure such as macroinvertebrate diversity or density. Or they can be based on a

physical habitat indicator such as pool/riffle ratio or percent fines sediment in gravel that have been adequately linked to characteristic uses.

Best management practices (BMPs) are specifically mentioned as a method for addressing NPS TMDLs. There are several factors to consider when evaluating whether BMPs are stringent enough to implement applicable water quality standards. They include:

- Data analysis of the controls relative to the problem;
- Mechanisms requiring implementation and maintenance of the pollution controls;
- Reasonable time frame for attaining water quality standards (water body responsive); and
- Monitoring to track implementation and effectiveness of controls.

A locally-managed watershed plan is one of the best approaches to implementing a NPS TMDL. The plan should represent the needs and views of a variety of affected parties. A basic objective of the plan should be to meet or exceed water quality standards. Where applicable, other in-stream targets may be established in the plan. Management plans should address specific resource protection and restoration issues which are outlined later in this guidance.

The plan may call for short-term fixes and/or long-term rehabilitation. It may rely on activities specifically controlled by human activities or may be a combination of natural and specific restoration or management activities. Examples of short-term TMDL implementation approaches are farm plans for a situation where a single farm or small number of farms can be shown to be the primary source of water quality impairment.

Longer-term TMDL implementation strategies may involve such things as shade plans where existing shade is retained and re-establishment of shade vegetation is enhanced. Another long-term plan could involve road and/or erosion management to limit further degradation while the stream is allowed to flush excess fine sediment out over a 20 or 30 year period. Both long-term examples involve management and natural processes.

Plans developed and used as partial elements of TMDLs can address watersheds of various scales. They can be as small as a reach or as large as a whole drainage. The key is the ability to identify relationships between sources of pollution and resources that are impaired. Specific practices need to be designed to address the sources and show likely improvement in the resource.

TMDLs can be used to address existing problems or may be used to prevent problems in the future. Those TMDLs designed to prevent future problems in pristine or high quality waters are often called "preventive" TMDLs. They are established on waters not currently on the 303(d) list. Preventive TMDLs should attempt to identify all characteristic uses in the watershed, and establish targets and practices to ensure that the uses are protected.

Finally, NPS TMDLs must include a provision for enforcement to back up voluntary plans. Noncompliance with plan provisions (i.e. no implementation of BMPs) may be grounds for enforcement action on specific individual polluters if the problem is clearly identifiable and persists in spite of local action. Other provisions for enforcement that have been accepted by EPA include inter-local agreements, local ordinances, consent decrees, and conditioned grant funding.

General Guidance on Developing TMDLs

The following is a summary of *Guidance Document for Developing Total Maximum Daily Loads (TMDLs) or Water Cleanup Plans*, August 3, 1999. It will be used to help local organizations develop TMDLs.

The purpose of this guidance document is to provide a clear description of how to develop and implement Water Cleanup Plans, also known as Total Maximum Daily Loads or "TMDLs." Water Cleanup Plans are the Department of Ecology's equivalent of the TMDLs that are required under section 303(d) of the federal Clean Water Act (CWA) for water bodies listed as limited because they do not meet state water quality standards. This guidance is based on TMDL requirements of the federal CWA and the January 1998 TMDL Memorandum of Agreement between the Department of Ecology and the U.S. Environmental Protection Agency (EPA).

A Water Cleanup Plan, or TMDL, is a common-sense, science-based approach to cleaning up polluted water so that it meets approved water quality standards. TMDLs involve an initial assessment of the water quality problems, a technical analysis to determine how much pollution must be reduced to protect the water, the selection and implementation of appropriate control measures, and follow-up monitoring to determine the success of the complete effort.

Certain essential elements must be included in every TMDL to ensure that the resulting plan will be complete, be acceptable to the public, and be approved by EPA. These elements are:

- A technical study identifying the pollutants causing the water quality problem and the sources of those pollutants.
- A wasteload or load allocation for pollutants that distribute allowable levels of pollution among contributing sources.
- A margin of safety to ensure water quality standards will be met under the worst conditions likely to be experienced.
- A Seasonal Variation.(WQ standards must be met during all seasons of the year)
- An implementation plan to clean up excess pollution.
- A follow-up monitoring plan to demonstrate success of pollution controls contained in the implementation plan or the need for additional action.
- Public involvement at all key decision steps of the process.

Special attention must be given to federally-recognized tribes who have treaty interest in the watershed and tribes with federally-approved water quality standards.

Public involvement is a vital part of every TMDL. Tribal participants must be involved as appropriate. In most cases, the public must develop the real solutions to mitigating pollution sources. Early identification and contact with those entities that are most affected and involved is a smart practice. Consideration should be given to providing public entities with information throughout all phases of the project, from start-up to implementation. Begin with basic explanations of a TMDL, its purpose, sequence, timing, implications, and projected schedule. Later, provide technical findings as they are developed. Finally, engage the public in the design of

pollution controls and mitigating strategies. The implementation phase will be greatly enhanced with the cooperation of affected public elements. (see Appendix A for Tribal Coordination Letters)

This guidance contains a series of sequential steps leading from the initial determination that a Water Cleanup Plan (TMDL) for a specific body of water is a priority project, through eventual implementation of control strategies and follow-up monitoring. Following the steps described in this guidance will assure that the technical, legal, and public participation aspects of TMDL development are being adequately covered.

Not all of the steps included in this guidance document will be required for every TMDL. Some steps are strongly recommended even though they are not required, and others are optional. The recommended sequence should be modified to fit the needs of each specific TMDL project.

The focus of this guidance is on the traditional form of TMDL development where the Department of Ecology performs the technical studies. There are other approaches. Watershed Analysis done by the US Forest Service or private timber companies is an example. Another is work done through partnerships between Ecology and local government or other groups established to accomplish watershed planning and restoration, or as part of salmon restoration plans. As long as the essential elements described above are included, each of these processes could result in a product that can be accepted as a TMDL.

References made to years one through five in the guidance reflect "normal" TMDL development, and correspond to the sequential activities outlined in the five-year, five-step Watershed Approach to Water Quality Management adopted by Ecology's Water Quality Program. The suggested time frames may be modified as needed, depending on the requirements of each specific TMDL.

Appendix B contains a set of summary flow charts. The charts illustrate at a glance the steps where EPA, Tribes, interested and affected parties, and the general public are involved in the process. They also show graphically which steps are required and which are optional.

Appendix C contains an outline TMDL Submittal Report. Properly completed, this Submittal Report currently satisfies EPA review requirements.

The settlement agreement to complete TMDLs

Ecology's work on TMDLs is part of a 15-year schedule for improving the health of the water segments on the 303(d) list. The schedule was initially set as part of an agreement between Ecology and EPA that settled a lawsuit filed against the two agencies in 1991. It limits the number of plans to begin each year because of resource constraints and requires five-year reviews to evaluate the state's progress.

Water Cleanup Plans have five main components:

- identification of the type, amount, and sources of water pollution in a particular water body or segment,
- determination of the capacity of the water body to assimilate pollution and still remain healthy,
- allocation of how much pollution each source will be allowed to discharge

- a strategy to attain the allocations, and
- a monitoring plan to assess effectiveness.

Strategies may include setting permit limits and recommending best management practices such as fencing, planting trees, and ensuring buffers next to streams.

The Schedule for Completing TMDLs

The 15-year schedule obligates Ecology to begin cleanup work in 1998 and to complete it in 2013, using a watershed approach to water quality management as the implementing framework. There are already more than 50 TMDLs underway. At the time of the settlement, 666 water bodies were on Washington's 303(d) list. This translates into 1568 water bodies needing TMDLs. Ecology estimates that about 70 percent of these TMDLs will need to address nonpoint source problems.

Priorities for this work have been established, as has a schedule for implementation. The schedule assumes that workload will expand as a result of additional funding and improved approaches. The legislature is currently considering legislation that might affect funding and the agency's ability to meet the schedule and agreement.

Recommendations

- Promote local watershed planning and implementation that address 303(d) listings and prevent further listings. Provide technical assistance
- Develop and implement a schedule for Water Cleanup Plans (TMDLs) focusing on watersheds with species listed under the Endangered Species Act
- Implement the Yakima River Sediment Reduction Plan

Enforcement

Enforcement is a key component of any nonpoint source program. Many feel incentives have little value without the threat of enforcement. Enforcement is used by several agencies and by local governments to ensure compliance with water quality regulations.

It plays an important role in nonpoint source programs. Though many programs are voluntary in nature, there is a need to have a regulatory backstop to encourage those who are not complying with basic requirements of environmental protection. Enforcement also provides cooperative landowners and businesses a sense of equity and a belief that their contribution is making a difference.

Recommendations

- Establish and implement collaborative processes to increase coordination of compliance and enforcement activities among the regulatory natural resource agencies with joint or primary jurisdictional authority
- Fully implement marine detachments within WDFW Enforcement to increase visible enforcement presence on marine waters
- Increase compliance and enforcement of the Hydraulic Code for habitat protection and increase compliance with fish passage and screening requirements

Monitoring

Monitoring is an essential element of this plan. Numerous implementation activities have been identified that support this plan. Many of these recommendations are linked to the Salmon Recovery Plan.

Recommendations

- Expand the development of a coordinated monitoring framework to integrate and/or coordinate statewide, regional, watershed and project-specific monitoring systems
- Expand ambient monitoring network in the state by 2% per year
- Track primary water quality indicators (pH, Temp, DO and Turbidity) using number of exceedances approach
- Increase water quality monitoring capacity in tribes, conservation districts, volunteers, and local governments through training and technical assistance
- Develop and implement criteria to guide the use of adaptive management, using data from monitoring systems
- Design and implement systems to track implementation and monitor effectiveness
- Develop a system or “index” to show how each watershed is responding to implementation of the plan
- Evaluate the effectiveness of current pesticide monitoring with an eye towards improving service delivery
- Recommend standard monitoring and data quality guidelines for salmon habitat projects
- Develop and implement a comprehensive marina and boater destination water quality monitoring program

General Program Needs

Throughout this plan development process, a number of global needs have been identified. Some focus on improving coordination while others focus on providing better tools to implementing agencies.

Recommendations

- Implement the Unified Watershed Assessment process for focusing federal, state, and tribal resources in an effective manner
- Expand the development of local watershed plans under chapters 75.46 & 90.82 RCW and other related acts
- Enhance the abilities of the Watershed Characterization Team to analyze the watersheds of the state and provide tools to others to do the same.
- Develop a cooperative and comprehensive interstate ground water protection plan with state (Oregon and Idaho) and tribal governments.
- Establish working agreements with various federal agencies to address Clean Water Act consistency requirements
- Adopt revised Guidelines for Shoreline Master Programs, and assist local governments to modify their Shoreline Master Programs
- Develop, adopt and implement standards for water quality and contaminated sediment
- Examine additional funding needs for DOH shellfish protection efforts
- Negotiate a “road map” to facilitate the integration of the requirements of the federal *Clean Water* and *Endangered Species Acts*
- Establish an information base for local communities that describes funding sources and necessary requirements.
- Enhance local ability to address water quality complaints and information requests
- Provide technical assistance and information regarding ESA compliance to communities

Chapter 10

Federal Consistency

The federal consistency provisions in Section 319 of the Clean Water Act authorize each state to review federal activities for consistency with the state nonpoint source management program. EPA guidance suggests that reviewing the specific goals, objectives, programs, and authorities contained in the nonpoint source management program would help the state align the programs and projects. The Clean Water Act, Section 1323, Federal facilities pollution control states:

(a) Each department, agency, or instrumentality of the executive, legislative, and judicial branches of the Federal Government ... shall be subject to, and comply with, all Federal, State, interstate, and local requirements, administrative authority, and process and sanctions respecting the control and abatement of water pollution in the same manner, and to the same extent as any nongovernmental entity including the payment of reasonable service charges.

A current court case affirms States' rights in water quality protection. On July 22, 1999, the 6th US Circuit Court of Appeals upheld Tennessee's right to fine the US Army for improperly removing asbestos from a munitions plant. The court ruled that the federal government does not have "sovereign immunity" from state sanctions under the Clean Water Act. This is an important decision for States trying to regulate federal facilities. Washington State supported Tennessee in this case.

In addition, the current statement for a Unified Federal Policy requires signatory agencies to work with State, tribal, and local agencies to:

1. Use a watershed approach to prevent and reduce water pollution resulting from Federal land and resource management activities; and
2. Accomplish this in a unified and cost-effective manner.

We will adopt certain implementation actions identified in the Unified Federal Policy as our own.

Federal Programs

Federal agencies have programs that help control nonpoint source pollution, programs that contribute nonpoint source pollution, or both. This section will discuss the types of programs the State will target for consistency with this water quality plan. The full range of programs and activities will be developed through one-on-one discussion with each agency.

1. Request Federal agencies adopt the Water Resource Inventory Area (WRIA) designation for delineation of watersheds in Washington State.

2. Request Federal agencies use the State's Unified Watershed Assessment process for prioritizing watersheds for protection and improvement
3. Coordinate Federal TMDL efforts with the State's TMDL schedule.
4. Other Unified Federal Policy implementation activities will be identified during initial meetings.
5. EPA's Geographic Initiatives program currently funds local activities according to the priorities of EPA's Office of Water. This program will be targeted for federal consistency review.
6. EPA's grant program for water quality in Washington State will be targeted to coincide with State grant programs and priorities.
7. EPA's Columbia Plateau Agricultural Initiative will be targeted to fund State's agricultural initiatives in that area.
8. US Forest Service Northwest Forest Plan will be reviewed for consistency with State programs
9. Interior Columbia Basin Ecosystem Management Plan will be reviewed for consistency
10. US Coast Guard facilities will be inspected for proper pump-out facilities
11. US Navy facilities within the Puget Sound will be visited
12. Other programs as appropriate.

Process for Implementing the Federal Consistency Provisions

This section outlines the process that will be used for fulfilling the federal consistency provisions. A description of each step with justification and timeline follow.

Step 1 - Survey each federal agency identified above to determine the types of activities and development projects each is involved with; find the management gaps, if any exist; and identify the additional nonpoint source issues that need to be addressed. These were the same three survey questions other agencies were asked before putting this document together. This will allow an understanding of the full range of responsibility at the federal agency level.

Step 2 - Meet individually with each federal agency. This step will be time-consuming but vitally important to start cooperative dialogue with those agencies where none or very little exists, and to continue dialogue with those agencies where relationships are in place. The one-on-one meetings will allow the State to explain the goals and objectives of its nonpoint source management program, water quality standards, and critical geographic areas. This time will also be used for determining the nature of the relationship and the need for formal or informal agreements.

Step 3 - Begin negotiating agreements. A model memorandum of agreement (MOA) will be used that meets the federal consistency requirements (See Appendix B). It will resemble the agreement between the US Forest Service and the Department of Ecology.

Ecology will ensure Forest Service compliance with the requirements of the federal Clean Water Act (CWA) through a memorandum of agreement (MOA) between the two agencies. The MOA is presently being developed, so could not be included in this document. It will be signed by Ecology's Director and by the Regional Forester, and has three major objectives:

1. To ensure that Forest Service activities meet federal CWA requirements;
2. To designate the Forest Service as the agency responsible for meeting CWA standards on National Forest Service System lands and to ensure that all waters on National Forest lands meet or exceed water quality standards for all activities; and
3. To encourage and enhance communication, coordination, and working relationships between the agencies and lay out a process for dispute resolution.

Because pollution caused by forest roads is a major concern for both agencies, the MOA will also set a schedule for the Forest Service to develop road maintenance and abandonment plans, and to bring all roads on Forest Service lands up to state standards, as defined in Washington's Forest Practices Rules. The Forest Service is required to finish all plans within five years, and to have all roads up to standard within 15 years.

The MOA outlines responsibilities and activities to be performed by each agency pursuant to several State and federal water quality programs.

Some of the agreements made and outlined in the MOA:

1. Agree to meet annually.
2. On an annual basis, develop a priority list of those basins with critical water quality problems.
3. Seek opportunities to coordinate and collaborate on management activities.
4. Conduct joint review of project implementation activities to determine effectiveness of BMP installation.
5. Consult each other on a yearly basis to discuss results and adequacy of monitoring activities.
6. Each year the Forest Service develops an Annual Forest Report which includes monitoring information

The relationship with each federal agency will be unique and distinct.

Step 4 - Implement agreements as they are approved, and track as many as possible.

Table 10.1
Timeline for Implementing the Federal Consistency Provisions

Fulfills Objective #	Federal Consistency Provisions	Responsible Organization	Action Status	Time-frame	Management Measure Number
1	Complete the MOA with USFS	ECY, USFS	Update		Additional
1	Survey other federal agencies to determine activities and development projects	ECY	New	9-30-2000	Additional
1	Meet one-on-one with each federal agency	ECY	New	12-30-2000	Additional
1	Begin negotiating agreements with NRCS, FSA, BOR	ECY, NRCS, FSA, BOR	New	1-1-2000	Additional
1	Begin negotiating agreements with DOE and Bonneville	ECY, DOE, Bonneville	New	6-1 2001	Additional
1	Begin negotiating agreements with Army, Navy, and Air Force	ECY, Army, Navy, Air Force	New	1-1-2002	Additional
1	Begin negotiating agreements with FWS, NPS, and BLM	ECY, FWS, NPS, BLM	New	6-1-2003	Additional
1	Begin negotiating agreements with FHA and USGS	ECY, FHA	New	1-1-2004	Additional
1	Implement agreements as they are approved	ECY, all	New	Ongoing	Additional

Chapter 11

Funding Nonpoint Activities Integrating Grants and Loans For Water Quality Improvement and Protection

Funding Available for Water Quality Efforts

Many entities fund projects that address water quality, habitat and watershed restoration efforts in Washington. The graphs below show anticipated expenditures from a variety of federal and State sources. They also show the need for coordination to make sure adequate funds are available to accomplish restoration and protection goals. Total expenditures are anticipated to exceed \$147 million dollars.

Figure 11.1
Federal 1999 NPS, Watershed, and Salmon
Recovery Expenditures in Washington

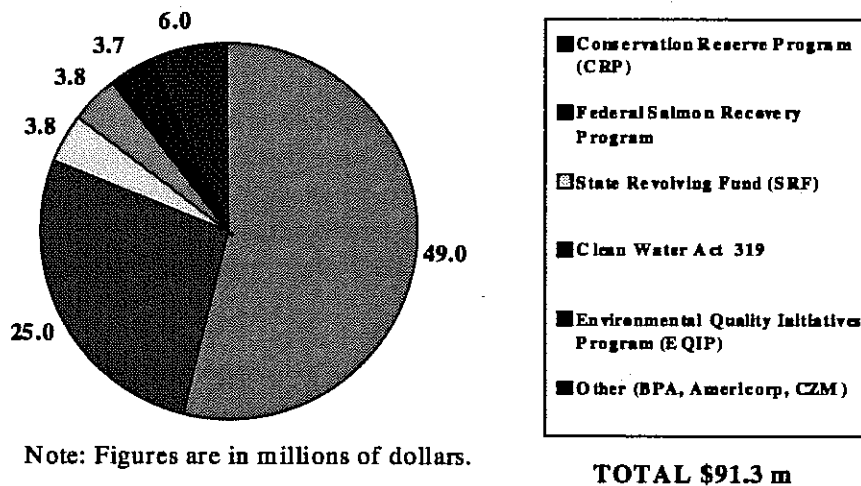
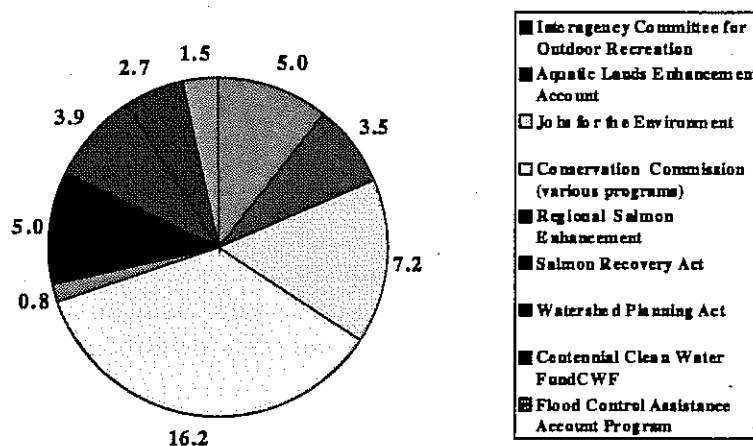


Figure 11.2
State 1999 NPS, Watershed, and Salmon
Recovery Expenditures in Washington



Note: Figures are in millions of dollars.

TOTAL \$45.8 m

In addition to the funding sources shown above, DOT spent over \$100 million on mitigation projects.

Though the amount of money seems significant, best indications are that it will take this level of funding, \$137.1 million of combined federal and state funds, for many years to clean up historical nonpoint source problems. It is important that these programs show progress in cleaning up water quality so that these funding sources keep helping with implementation. Given that there is no guarantee of funding from year to year, it is important that other means are found to help implement cleanup programs.

State funds are available to implement BMPs through grants from the Conservation Commission and Ecology, and through low-interest loans from the State Revolving Fund.

In addition to the programs shown in the Federal chart above, the US Department of Agriculture administers the Wildlife Habitat Incentive Program (WHIP), the Wetlands Reserve Program (WRP), and the Conservation Reserve Enhancement Program. In Washington, the CREP program hopes to enroll farmers whose land totals 100,000 acres or 3-4,000 miles of riparian habitat on farmland next to salmon spawning streams. At least \$200 million will be available to help Washington farmers restore salmon habitat and protect water quality over the next 15 years.

For small timberland owners, several programs provide incentives, technical assistance, and education. The NRCS, in conjunction with locally-based conservation districts, helps timberland owners write forest conservation plans. The Agricultural Conservation Program assists with forest

practices and soil conservation. The Forestry Incentive Program, sponsored by DNR, helps timberland owners with forest production and habitat planning.

Other incentives for water quality improvement include the Washington Conservation Corps and other jobs programs at Ecology and DNR which provide free or low-cost BMPs including fencing, in-stream habitat structures, and other measures to improve habitat and water quality. Marina owners may apply for federal Clean Vessel Act funding through State Parks for installation of pumpouts and other sanitation systems in marinas. Ecology also provides funding to local governments for pollution prevention and waste management through Coordinated Prevention Grants.

Description of Funding Programs

ECOLOGY'S WATER QUALITY FUNDING PROGRAMS

Since the early 1970s, Ecology has administered money and provided technical assistance to help communities improve and protect water quality. The current funding programs are the Centennial Clean Water Fund, State Water Pollution Control Revolving Fund, and the federal Clean Water Act Section 319 Nonpoint Source Program.

Ecology's Water Quality program administers several State and federal financial and technical assistance programs to improve and protect water quality. For fiscal years (FY)1997 – 2000, Ecology will have offered nearly \$270 million in grants and low-interest loans to local governments and Indian tribes and other eligible agencies to help address the State's critical water quality problems.

When coupled with substantial local efforts and financial commitments, Ecology's integrated water quality financial assistance program addresses many of the State's most urgent needs. The program encourages and facilitates the development of local capacity to meet local needs.

A 1986 State statute created the Water Quality Account, which is financed primarily through taxes on tobacco products. The account includes the **Centennial Clean Water Fund**. As of January 1999, Ecology has provided approximately \$438 million of Centennial funds as grants and loans to public bodies for water pollution control projects.

In 1987, the United States Congress established the **State Revolving Fund (SRF)** to replace the federal Construction Grants Program. The SRF provides low-interest loans to public bodies for water pollution control projects. These loans are administered in Washington State by Ecology. Ecology has provided approximately \$314 million in low-interest loans to local governments and Indian tribes under the SRF.

In 1987, Congress amended the Clean Water Act to establish the **Section 319 Nonpoint Source Management Program**. Under Section 319, State and Indian tribes receive grant money to support a wide variety of activities including technical assistance, financial assistance, educational training, technology transfer, demonstration projects and monitoring projects to assess the success of specific nonpoint source implementation projects. To date, Washington State has received approximately 16 million in grant funds to reduce the effects of nonpoint source pollution.

Grants/Loan Application

Since FY 97, Ecology has had a combined annual application process for the Centennial and SRF programs. The Section 319 program was added to the combined process in FY 98. Consolidating the application process has substantially improved efficiency and effectiveness in the administration of the funds. Applicants are asked to complete only one application regardless of the type of funds they are requesting. Applicants are then ranked solely on the basis of water quality improvements and protection to be achieved.

Recent Funding Cycles

Under the combined application cycle, local governments, Indian tribes, special districts, and not-for-profit groups requested approximately \$350 million in the fiscal year 1997 – 2000 funding cycles. During this time, approximately \$267 million has been available from the sources listed below:

Centennial Clean Water Fund	\$134 million
State Revolving Fund	\$130 million
Section 319 Fund	\$ 3 million

Although a significant percentage of funding is allocated to bring point source facilities into compliance with water quality standards, at least \$22,412,950 million was allocated to nonpoint source water pollution control projects during the past three yearly funding cycles (FY 97, 98, and 99).*

Furthermore, Ecology has aggressively and successfully marketed its SRF program toward nonpoint pollution control and prevention. Since the SRF program began, over \$17 million has been issued in loans to public bodies for 66 high priority nonpoint projects. This commitment represents six percent of the total loan portfolio.

The Funding Sources

The Centennial Clean Water Fund Program

The Centennial Fund, authorized by Chapter 70.146 of the Revised Code of Washington (RCW), provides grants and low-interest loans to “public bodies” (local governments and Indian tribes) for water pollution control facilities and activities designed to prevent and control water pollution to our state’s surface and ground water. Ecology’s Water Quality Program has administered the Centennial fund since its inception.

The legislature directed that the Centennial Fund be used to finance the planning, implementation, design, acquisition, construction, and improvement of water pollution control facilities and related activities. Ecology’s goal is to ensure that the fund is distributed among those projects that address the State’s highest needs for water quality protection and water pollution control.

The Washington State Water Pollution Control Revolving Fund (SRF) Program

Washington's SRF provides low-interest loans to public bodies for projects that improve and protect the State's water quality. The United States Congress established the SRF program as part of the Clean Water Act (CWA) Amendments of 1987. The amendments authorized the EPA to offer yearly capitalization grants to states for establishing self-sustaining, low-interest loan programs. In response, the Washington State Legislature passed a statute in 1988 (Chapter 90.50A RCW, Water Pollution Control Facilities – Federal Capitalization Grants) which created Washington's own SRF Program. Funding for the program includes federal grants and a 20 percent state match composed of Water Quality Account funds. Funding may also include monies from loan principal and interest repayment.

The SRF provides low-cost financing or refinancing of eligible costs for projects including publicly owned wastewater treatment facilities, nonpoint source pollution control projects, and comprehensive estuary conservation and management projects.

Clean Water Act Section 319 Nonpoint Source Program

The Section 319 Nonpoint Source Program provides grant funding to local governments, tribes and other agencies for projects that improve and protect the State's water quality. The United States Congress established the Section 319 program as part of the Clean Water Act (CWA) Amendments of 1987. The EPA offers Section 319 funds to states, subject to an annual appropriation by the U.S. Congress. Funding for Washington's Section 319 Program includes federal grants and a 40 percent state match.

This program offers grants for the management of nonpoint source pollution, to improve and protect water quality. Projects must implement nonpoint source pollution control strategies and demonstrate direct or indirect water quality benefits through preventing or controlling nonpoint sources of pollution. Examples of projects that are funded include implementation of stream and habitat restoration, use of agricultural BMPs, stormwater pollution control, water quality monitoring, and lake restoration efforts that focus on pollution prevention.

Who Can Apply

Applications for grants and loans are accepted from any public body in Washington state. Eligible public bodies include any state agency, county, city, town, conservation district, or other political subdivision, municipal or quasi-municipal corporation, or any tribe recognized by the federal government. Applications from not-for-profit organizations that are recognized as such by the Internal Revenue Service are accepted ONLY for Section 319 grants. However, because funding for Section 319 grants is extremely limited, not-for-profit organizations are encouraged to work with a public body.

Integrating Local Plans and Priorities into the State's Nonpoint Strategy

Local priorities have been given special consideration and points under Ecology's funding program. Appendix C, Determining Local Priorities, outlines the process locals must use when submitting

applications. There are two ways in which local priorities are identified and eligible for funding under Ecology's funding program:

1. If an applicant has a plan that has been approved, then they are eligible to receive implementation funds. The plan will be incorporated by reference into Appendix A, Watershed Summaries for the 62 WRIAs of the State. It is incumbent on locals to inform Ecology when a plan is completed, and what priority it plays at the local level.
2. An applicant may apply directly to implement an action identified in the State's Nonpoint Source Strategy. The action number and source category should be identified in the application. Ecology even encourages locals to apply for those actions.

The process for integrating local plans and priorities will be refined in subsequent years. The process for developing this has been listed as a general recommendation and a specific report on this process will be transmitted to EPA.

Maximum Financial Assistance Available and Match

To help ensure that financial assistance is extended as far as possible, ceiling amounts and match requirements are imposed.

Ceiling amounts have been set for Section 319 grants, and for Centennial grant and loan participation per project:

- For each **activity** project, the total amount of Section 319 grant and Centennial grant and loan assistance cannot exceed \$250,000 per annual funding cycle.
- For each **facility** project, the total amount of Centennial grant and loan assistance cannot exceed \$2.5 million per annual funding cycle.

A local match of 25 percent of total eligible project costs must be provided for water pollution control **activity** grants from the Section 319 and Centennial funds.

A local match of 50 percent of total eligible project costs must be provided for water pollution control **facility** grants. Grants to help finance water pollution control facilities are only available from the Centennial fund.

For SRF loans, eighty percent of the fund is to be used for water pollution control facilities, ten percent of the fund is reserved for nonpoint source pollution control, and ten percent is allocated for comprehensive estuary conservation and management projects. Unless the demand for funds is limited, not more than 50 percent of each funding category allocation can be awarded to any one applicant. In addition, if requests for SRF assistance in one category do not result in the offer of all available funds, any remaining funds are transferred to other categories. Loans may be provided for up to 100 percent of the total eligible project cost.

How the Funding Cycle Works

Centennial, SRF and Section 319 funding cycles are initiated jointly on an annual basis. The yearly application period traditionally begins in early January and ends in late February. A public announcement about the funding cycle, the amount of money anticipated to be available, and the loan interest rates will be made before the application period opens. In addition, public workshops are held in early January at various locations statewide to explain the application process and general program requirements. Applications and guidelines are available at Ecology's website located at: <http://www.wa.gov/ecology>

Applications are project proposals that constitute the basis for the preparation of grant and loan contracts or "agreements" (for successful applicants). The applications also constitute draft Section 319 workplans. The grant agreement is the final workplan.

Application Considerations

In evaluating applications for funding consideration, water quality specialists from within Ecology and other state agencies review and prioritize all submittals based on water quality based selection criteria. Evaluation criteria for the four major question areas are provided in the application. In addition, other information may be provided by the applicant to further support the project in the consideration of priority.

During the FY 2000 funding cycle, for example, the main categories used on the application were:

- I. Existing or potential water quality problem, threat or need (320 points)
- II. Effectiveness of proposal in addressing the water quality problem, threat, or need and achieving desired outcome (320 points)
- III. Local management efforts (120 points)
- IV. State and federal mandates (140 points)
- V. Local priority-setting process (100 points)

The possible total points are 1,000.

Evaluation of Application and Section 319/Centennial/SRF Allocations

After the application period, all eligible applications are evaluated and prioritized. Water quality and public health specialists from Ecology and other State agencies review and evaluate the applications. When all projects have been ranked, the nonpoint proposals are evaluated for how well they meet the goals and objectives of the Section 319 program. These criteria have been agreed to by Ecology and EPA and are published in Program Guidelines. Insofar as possible, these highest priority projects are proposed for funding by the Section 319 Program. Other high priority projects are proposed for funding by the Centennial or SRF programs, based on the applicant's request for funding.

After biennial appropriations are made to the Centennial Fund by the legislature and approved by the Governor, a combined document is prepared consisting of the Draft Centennial and Section 319 Offer Lists, and the Draft Intended Use Plan (Draft IUP) for the SRF. This document is prepared in

accordance with the statewide prioritized list and funds available. It contains lists of projects proposed to receive financial assistance under all three programs, and it is distributed to all applicants and other interested parties. The issuance of these lists is followed by a 30-day public review and comment period, after which another combined document consisting of the final Centennial and Section 319 Offer Lists and final IUP is published. Responsiveness summaries (responding to any comments Ecology has received on the proposed awards) are also included in the document.

Developing and Signing Agreements

When a project has been identified on the Section 319 or Centennial final offer list or SRF IUP, the applicant and Ecology staff use the application as a basis and refine the scope of work, grant and/or loan requirements, and budget for the grant or loan agreement. A grant or loan agreement is written after the applicant and Ecology concur on the appropriate scope of work, schedule, eligible costs, and other details.

By signing an agreement, the recipient accepts the terms and conditions of a grant or loan offer. Specifically, they agree to comply with all the applicable federal, State, and local statutes, regulations, orders, permits, program guidelines, and the general terms and conditions of the grant or loan agreement. They may also need to comply with other conditions, including, but not limited to, environmental review, procurement, discrimination, labor, job safety, drug-free environments, and anti-lobbying requirements. Recipients must also comply with the State and federal goals governing minority and women-owned business enterprises.

Milestones and Project Completion

Quarterly progress reports are required for all Centennial grants/loans and SRF loans. Semiannual progress reports are required for all Section 319 grants. These reports must be submitted before applicants can receive payment for costs incurred during that quarter.

All grant and loan recipients must maintain accounting records in accordance with generally accepted government accounting standards. These standards include those contained in the most recent editions of the United States General Accounting Office publication, *Standards for Audit of Governmental Organizations, Programs, Activities, and Functions*, and Ecology's *Administrative Requirements for Ecology Grants and Loans*. In addition, recipients must maintain an accounting system which can track project expenditures separately from other expenses.

Ecology may conduct periodic administrative reviews of funded projects to evaluate a recipient's records and accounting systems. These reviews verify that eligible and ineligible project costs have been documented for audit and that recipients are in compliance with the applicable State statutes, regulations, and requirements (including special grant or loan conditions).

When the scope of work contained in the agreement is fully completed and an adequate final report is accepted, Ecology issues the final payment, Ecology staff complete a final performance evaluation, and the grant is formally closed. Loans enter the repayment phase and are closed after final repayment.

Section 319 Reporting Responsibilities

The federal government requires Ecology to submit Financial Status Reports and project progress reports for all open Section 319 grants at specific times each year. Financial Status Reports are submitted to EPA within 90 days of the end of each budget period. These reports are generated automatically by the Grants Receivable System at Ecology's Fiscal Office. This system tracks federal and matching state funds from federal grant initiation through grant close-out.

Progress reports are presently required on a semiannual basis. According to their grant agreements, recipients are required to submit these reports at least 15 days before reports are due to be submitted to EPA, in order to receive payment for costs incurred during the period. Project milestones such as quality assurance plans and other deliverables are tracked by Ecology staff as they review these reports.

ECOLOGY'S SHORELANDS AND ENVIRONMENTAL ASSISTANCE (SEA) FUNDING PROGRAMS

Ecology's SEA Program administers four grant programs. The Shoreline Management Planning Grants (Coastal Zone Management Section 306) and the Shoreline Public Access Construction Grants (Coastal Zone Management Section 306A) were established by federal law in 1972 and are administered by the National Oceanic and Atmospheric Administration (NOAA). The Flood Control Assistance Account Program (FCAAP) was established by the State legislature in 1984 to help local jurisdictions reduce flood hazards and damages. The newest grant program, the Comprehensive Watershed Planning bill (90.82 RCW) was created by the State legislature in 1998 to address this State's increasing population growth and increasing demands on water resources.

The Funding Sources

The Shoreline Management Planning Grants (Coastal Zone Management Section 306)

Ecology administers a grant program that helps local jurisdictions with comprehensive planning for improving shoreline management within the State's coastal zone. The Coastal Zone Management (CZM) Act "Section 306" grants program was established by federal law in 1972 and is administered by the National Oceanic and Atmospheric Administration. Ecology's Shorelands and Environmental Assistance Program grants approximately \$425,000 annually to local governments.

Eligibility

Applicants must be located within Washington's coastal zone, defined as the 15 counties with saltwater shorelines.

Coastal Zone Management planning grants are used for the following activities:

Preparing Shoreline Master Program amendments, including public involvement and the review and approval processes necessary for local adoption. Planning efforts that integrate

shoreline management with growth-management comprehensive plans and regulations are given high priority.

Urban waterfront planning that leads directly to more specificity in local master programs.

Special area management plans directed toward resolving critical shoreline management concerns (i.e., dunes management, estuarine water quality, urban runoff control, etc.) or toward geographic areas presenting difficult management problems or unique opportunities.

Innovative wetlands protection and education projects that can be used as models by other local jurisdictions.

Public information and education programs designed to enhance understanding of shoreline management policies and regulations, the permit and enforcement processes, or the natural systems of the coastal zone.

Site planning and design for public access improvements, waterfront restoration, interpretive centers, and similar facilities.

Analysis of major coastal facility siting proposals which, because of their unusual size or location, have regional or statewide resource implications.

To support Washington State's efforts to save endangered salmon, Ecology will give preference to grant projects that support the recovery of salmon and other declining fish species.

Grant Time Frame

Coastal Zone funds carry a strict time frame from July 1 of one year to June 15 of the next year. Any allocated funds that are not spent during the State fiscal year are lost and cannot be carried over to the next fiscal year.

Matching Requirements

A minimum local-match ratio of 1:1, or 50 percent of the total cost, is required. The match can be in cash (*such as paid staff costs*) or in-kind (*donated*) services such as citizen volunteer time. Any non-federal grant source related to the CZM project which has not been previously used as match can be used (*e.g., a State-funded wetlands inventory grant can match a CZM grant for shoreline master program amendments*). CZM grants do not carry a cash match requirement.

Applications

Applications for CZM grants are sent to interested parties in early January and must be submitted to Ecology in late February. Applications are evaluated on a competitive basis. Because requests usually exceed available funds, not all proposals can be funded, and in some cases only selected components of a proposal may be funded.

Shoreline Public Access Construction Grants (Coastal Zone Management Section 306A grants)

Ecology administers this grant program that helps local governments improve public access to shores. The "Coastal Zone Management Act Section 306A" grants program was established by federal law in 1972 and is administered by the National Oceanic and Atmospheric Administration. At the State level, these funds are administered through Ecology's Shorelands and Coastal Zone Management Program. Approximately \$50,000 is available annually for distribution to local governments.

Eligibility

Applicants must be located within Washington's coastal zone, defined as the 15 counties bordering on saltwater. Additionally, these 306A grants for small construction and acquisition projects require documentation that must be approved by NOAA's Office of Ocean and Coastal Resource Management.

Projects funded with 306A money are generally small, simple facilities that provide public access to previously inaccessible shoreline areas. For example, access might currently be limited by a physical barrier, such as a steep bank where a ramp could be constructed. Grants are also used to protect threatened habitat and natural features. Projects include:

- Development and acquisition projects that provide, preserve or enhance **public access** to shorelines of the State which are generally not major parks, playgrounds and the like.
- **Acquiring wetlands** which are identified as having value for preservation and which are designated by local governments as areas for preservation and restoration.
- **Redeveloping degraded and/or under-used urban waterfronts**, which will result in increased public use.

Grant Time Frame

Coastal Zone Management (CZM) grants for public access carry a strict time frame from July 1 of one year to June 15 of the following year. Any allocated funds which are not spent during the state fiscal year are lost and can not be carried over to the next fiscal year.

Match Requirements

A minimum local match ratio of 1:1, or 50 percent of the total cost, is required. The match can be in cash (such as paid staff costs) or in-kind (donated) services (such as citizen volunteer time). Any non-federal grant source related to the CZM project which has not been previously used as match can be used. CZM grants do not carry a cash match requirement.

Applications

Applications for CZM grants are sent to interested parties in November, and must be submitted to Ecology in January. Applications are evaluated on a competitive basis by a shoreline-management review team. Because requests usually exceed available funds, not all proposals can be funded, and in some cases only selected components of a proposal may be funded.

Flood Control Assistance Account Program (FCAAP)

The Flood Control Assistance Account Program (FCAAP) was established by the State legislature in 1984 to help local jurisdictions reduce flood hazards and damages. Matching grants are available to counties, cities, towns and other special districts for comprehensive flood hazard management plans, specific projects or studies, and emergency flood-related activities. The program is administered by the Department of Ecology. (See Chapter 86.26 RCW – State Participation in Flood Control Maintenance, and Chapter 173-145 WAC – Flood Control Assistance Account Program.)

Four million dollars is placed in the Flood Control Assistance Account by the State Treasurer at the beginning of each fiscal biennium (July 1 of odd-numbered year) to provide for grants and for program administration. Up to \$500,000 in non-emergency grant funds is available during the biennium within any one county. Allocated funds may not be carried over to the next biennium.

Eligibility

To be eligible for any FCAAP grant, a local jurisdiction must participate in the National Flood Insurance Program (NFIP).

Activities Funded

Matching grants are available on a reimbursable basis for **Comprehensive Flood Hazard Management Plans** (referred to as Comprehensive Flood Control Management Plans in Chapter 86.26 RCW) – Grants up to 75 percent of cost help local jurisdictions prepare comprehensive plans. A plan must determine the need for flood hazard management work, assess alternatives, analyze environmental impacts, evaluate problems and proposed solutions, and prioritize recommendations. Other elements of a comprehensive plan are described in Ecology's *Comprehensive Planning for Flood Hazard Management (Ecology Publication #91-44)*. Approved plans meet federal and state requirements for local hazard mitigation plans.

Grants up to 50 percent of cost are available for **Flood Damage Reduction Projects and Studies** - projects that preserve or restore natural conditions, or restore or enhance facilities or structures. Maintenance projects must be consistent with a flood hazard management plan. Grants may also be used for funding up to 50 percent of the non-federal share of U.S. Army Corps of Engineers feasibility studies. Project grants are only available to local jurisdictions that already have (or are currently developing) a comprehensive flood hazard management plan. Proposals for projects that are specifically identified in a comprehensive plan are given higher priority for FCAAP funds than

projects that are not identified in a plan. *(Note: Projects identified in comprehensive plans are also more likely to receive funds from other grants sources as well, such as the Hazard Mitigation Grant Program, and the Community Development Block Grant Program.)*

Emergency Food-related Projects – A limited number of grants up to 80 percent of cost are available for flood-related work that must be done immediately to protect lives and property. The local jurisdiction must declare an emergency and Ecology must approve the work. Up to \$150,000 is available for all jurisdictions in any one county in addition to non-emergency funds, subject to availability.

Other eligible projects:

- Flood warning systems (State share up to 75 percent of total projects cost)
- Bioengineered bank stabilization projects (State share up to 50 percent of total project cost)
- Public awareness programs (State share up to 75 percent of total project cost)

Application Schedule

Prior to each State fiscal biennium, in the fall of even numbered years, Ecology invites local governments to apply for FCAAP grants. Allocation of funds takes place prior to the beginning of each biennium (July 1 of odd numbered years). Local governments may submit applications to Ecology at any time during the biennium, and will be notified should funds become available.

Flood plans can serve as hazard mitigation plans. A comprehensive flood hazard management plan can be used as a hazard mitigation plan required by the state Emergency Management Division. This can simplify local planning efforts considerably, because local governments need only do the work once. The integrated planning process also increases collaboration between agencies, and allows local governments to make better use of various flood-related grants (such as FCAAP, hazard mitigation and community development block grant programs).

Watershed Planning Grants

In response to the increasing demands on water resources, the 1998 legislature passed 90.82 RCW, the Comprehensive Watershed Planning bill. The bill provides a framework for developing local solutions to water issues on a watershed basis.

Framed around watersheds or sub-watersheds known as Water Resources Inventory Areas (WRIAs), the comprehensive watershed planning process is designed to allow local citizens and local governments to join with tribes to form watershed management planning units to develop watershed management plans. State agencies provide technical assistance and, if requested, serve on the planning units.

Planning units organized under the legislation are required to do a detailed assessment of the planning area's current water supply and uses, and recommend long-term strategies to provide adequate water for fish and future growth. The planning units **may** also choose to develop strategies for improving water quality, or for protecting or enhancing fish habitat, and, in collaboration with the Department of Ecology, **may** set minimum instream flows.

Watershed Planning Grants Under 90.82 RCW

The 1998 State legislature appropriated \$3.9 million to start the watershed planning process. Those funds, administered by Ecology, were used to start watershed planning in 27 watersheds across the State.

Ecology has received \$9 million in the 1999 legislative process to pass on to local planning efforts for the continued support of watershed planning. \$4.5 million can be appropriated for each fiscal year. The new funds will be used to advance planning in watersheds that started in 1998, as well as to fund new watershed planning initiatives.

While there is a significant amount of money to support local watershed planning, the agency will be limited in the direct technical assistance that it will be able to provide.

Funding is available in three phases.

- Phase I, The organizational phase. Initiating governments (through a designated lead agency) may apply for an initial organizing grant of up to \$50,000 per WRIA or \$75,000 for a multiple WRIA watershed management area to begin the local watershed planning effort.
- Phase II, the assessment phase. Once the organizational phase is completed, a planning unit may apply for up to \$200,000 per WRIA to fund watershed assessments.
- Phase III, the planning phase. A planning unit may also apply for up to \$250,000 per WRIA for the development of a Watershed Management Plan.

Priorities will be in the following order:

- Planning units moving from Phase 1 to Phase 2 who demonstrate a readiness to proceed within the biennium will be given the highest priority.
- Planning units moving from Phase 2 to Phase 3 who demonstrate a readiness to proceed within the biennium will be the second highest priority.
- The new planning units located in one of the 16 critical fish basins, identified in the Governor's Draft Salmon Recovery Plan, who meet the eligibility criteria outlined above will be the next highest priority.
- The next priority will be given to the eligible planning units located outside of a critical area that applied last year but did not receive funding.

New Planning Units – Phase I Organizational Funding

Applications to initiate planning must be submitted by the lead agency. Applications for grants must include proposals for conducting the water quantity component of a watershed plan. The water quality, habitat, and setting instream flow components of watershed planning are optional. However, the Ecology encourages planning units to do comprehensive watershed planning. If a planning unit decides to include the habitat component, then they must coordinate with the lead entity under the Salmon Recovery Act.

How to Get Started on Phase I

Planning under the Watershed Planning Act is for one or more WRIAs. All counties within the WRIA(s), the largest city or town within each WRIA, and the water utility obtaining the largest quantity of water within each WRIA must agree to start the watershed planning process. These entities are defined in the legislation as the “initiating governments.”

If the initiating governments unanimously decide to pursue watershed planning under 90.82 RCW, they must then invite any tribe(s) with reservation lands within each WRIA to participate as an initiating government. These entities, including the tribe(s), if they choose to join the initiating governments, must then designate a “lead agency.” The lead agency will submit the grant application to the department on behalf of the initiating governments.

Each lead agency applying for grants must provide evidence that it has been designated as a lead agency by the appropriate initiating governments. The lead agency must also show that all tribes that have reservation land within the WRIA(s) have been invited to participate as an initiating government.

Priority applicants must show that:

- A watershed planning group or organization has been in existence for more than one year,
- The plan would address a watershed which has endangered/threatened and in which there is an inadequate water supply for future growth (one of the 16 critical basins identified in the Governor’s Draft Salmon Recovery Plan), and
- The watershed planning area includes more than one WRIA

Lead agency recipients are required to:

- organize the planning unit and provide for representation of a wide range of water resource interests
- determine the scope of the planning to be conducted
- consider all existing plans and related planning activities in order to meet the requirements of RCW 90.82.030(3)
- work with State government, other local governments within the management area, and affected tribal governments, in developing a planning process.

Assessment and Planning – Phase 2 and Phase 3 Funding

Applicants for Phase 2 or Phase 3 dollars must submit a letter of intent indicating when the planning unit expects to be ready to move on to phase 2 or phase 3 in this fiscal year. If your watershed is not immediately ready to proceed to Phase 2 or 3, the letter of intent will be used by Ecology as a placeholder for the current fiscal year. That is, Ecology will set aside funds until planning units are ready to proceed later in the fiscal year.

Readiness to Proceed

These applications will be evaluated for readiness to proceed by assessing the completion of tasks identified in the scope of work in Phase 1 and/or Phase 2 contract agreements with Ecology. The specific requirements identified in the legislation will also be used to determine readiness to proceed to the next stage of the grant program.

Planning units moving from Phase 1 to 2 or from Phase 2 to 3 must demonstrate that they have completed all or substantially all of the tasks outlined in their current contract with Ecology before receiving additional funding.

The technical assessment requires:

- an estimate of the surface and ground water present in the management area;
- an estimate of the surface and ground water available in the management area, taking into account seasonal and other variations;
- an estimate of the water in the management area represented by claims in the water rights claims registry, water use permits, certificated rights, existing minimum in-stream flow rules, federally reserved rights, and any other rights to water;
- an estimate of the surface and ground water actually being used in the management area;
- an estimate of the water needed in the future for use in the management area;
- Location of areas where aquifers are known to recharge surface bodies of water and areas known to provide for the recharge of aquifers from the surface; and
- An estimate of the surface and ground water available for further appropriation, taking into account the minimum in-stream flows adopted by rule or to be adopted by rule under this chapter for streams in the management area including the data necessary to evaluate necessary flows for fish.

The plan development requirements are

The plan is to address the following strategies for increasing water supply with the objective of supplying water in sufficient quantities to satisfy in-stream flow for fish and to provide water for future out of stream use:

- Water conservation
- Water reuse
- Use of reclaimed water
- Voluntary water transfers
- Aquifer recharge and recovery

- Additional water allocations
- Additional water storage and storage enhancement

Chapter 12

Keeping the Process Going

This plan identifies a broad range of existing nonpoint programs and sets in motion a series of additional actions designed to improve the overall program effectiveness. There are several ways to determine whether the implementation activities have led to water quality improvements. Certainly, attaining water quality standards will be a primary indicator, but there will be others that will count toward plan success.

Roles in Implementation

There are several entities involved with implementing this plan. In Chapter 6 we identified them and the roles each plays:

The **Water Quality Program** of the **Department of Ecology** is responsible for overseeing the implementation of this plan. That means Ecology will be the primary driver in coordinating plan activities, compiling progress reports, and reporting back to the Federal Agencies. Ecology will also implement many of the actions identified in the plan. Ecology will also take the lead in coordinating activities with the state agency workgroup.

State Agency Workgroup will meet each year to discuss general work plan activities. At these meetings, progress will be reviewed and adjustments made as necessary to work plans and schedules. More frequent meetings will be held between partnering agencies to plan and carry out projects requiring coordination. The State Agency Workgroup will report each year to the Water Quality Partnership. (See milestones under "General Needs" in Table 12.1.) Presentations will be made as appropriate on products completed and activities underway. The committee will incorporate feedback into the work plan as appropriate. Finally, a biannual public workshop will be held to discuss the plan progress and to solicit new ideas and tools from local implementers.

Water Quality Partnership is an advisory group of industries, local governments, tribes, environmental organizations, and others who assist the Water Quality Program at Ecology with general program direction. Ecology will forward any advice this group offers about nonpoint pollution control efforts to the State Agency Workgroup.

Local Governments, Tribes, and Special Purpose Districts are the on-the-ground implementers of many nonpoint pollution control activities. This nonpoint management plan relies heavily on the continued commitment of energy and resources by these entities. Many current and planned actions are designed to assist them with their implementation efforts. Ecology will monitor the progress of the plan and keep contact with these implementers to determine plan success. Although they often use financial assistance from state agencies, these agencies do not direct local entities' activities to control nonpoint pollution unless there is a state law or permit involved. However, Ecology and

other agencies can promote certain policies and priorities through the way they distribute financial assistance. It is imperative the agencies make these priorities clear.

Progress Review

Progress toward meeting the goals and objectives of the plan will be evaluated and discussed by the State Agency Workgroup. Members of this workgroup have access to their agencies' data, programs, and activities at the local level. They will work closely to align activities and support each other in the broader direction of plan activities.

How success will be determined

Four questions will direct the type of benchmarks that will indicate the success of this strategy:

1. Is water quality improving?
2. Are the programs identified in the strategy working?
3. Is this statewide nonpoint strategy effective?
4. What changes are needed in this strategy to improve effectiveness?

Question #1: Is Water Quality Improving?

This question will be answered principally by evaluating three sets of information:

1. Baseline and ambient monitoring
2. Violation frequency
3. 303(d) listed water bodies

Baseline and ambient monitoring will provide long-term trend information on several water quality parameters around the state. These data are relatively gross in nature due to the approach used. However, they do provide a long-term look at conditions across the state.

Violation frequency is another approach to water quality analysis. This involves looking at the same ambient data, but looking for the frequency of violation as an indicator of change. It is not a trend analysis, but does provide a sense of how often a water body is out compliance over time.

Finally, an examination of the biennial 303(d) list will indicate which water bodies have met water quality standards. This is a true indicator of water quality improvement at a site or throughout a watershed. Data from across the state is used to list water bodies not meeting State water quality standards.

These three analyses will be carried out by Ecology staff on an annual basis and reported to EPA and other appropriate advisory groups.

Question #2: Are programs identified in the strategy effective?

At this time, there is no overarching approach to determining the effectiveness of the programs included in this plan. Due to the concerns surrounding salmon, shellfish, and drinking water, numerous efforts over the last few years have advanced our understanding considerably in many areas, particularly forest management. Rules continue to be developed from studies over the last 12 years designed to determine how to adequately protect public resources. Work in this area will continue with the advent of new practices mandated by the Forests and Fish Report.

Effectiveness of the programs relates to both implementation of BMPs and the effectiveness of BMPs. The state will continue effectiveness monitoring of BMPs and will track BMP implementation activities.

A partial list of the different types of monitoring programs is shown below. We expect this list to change as further efforts to protect key resources continue.

1. Agricultural BMPs: Improvements in agricultural BMPs have made significant advances as well in the last 10 years. However, there are still numerous questions about effectiveness – particularly in the area of riparian protection. In many cases, these concerns have as much to do with level of implementation (under voluntary programs) as they do with the effectiveness of the BMP itself. The Agriculture Fish and Water process has recently started to evaluate changes to the Field Office Technical Guides used by NRCS and practices used by irrigators. The process will result in practices that meet requirements of the Clean Water Act and Endangered Species Act.
2. Stormwater BMPs: Perhaps the biggest area of concern is urban stormwater. Researchers have shown that many of the design standards implemented over the last 10 years fail to protect salmon habitat. Studies have shown that the amount of impervious area of a watershed has a direct effect on habitat. The Endangered Species Act requirements are causing resource agencies and local governments to study the problem very carefully and to look for other innovative land use approaches. A new stormwater management plan for the state is being considered which will likely include an evaluation of new stormwater BMPs.
3. Post-TMDL monitoring. Post-TMDL monitoring is conducted to verify that the pollutant controls resulted in the water body meeting water quality standards. It also tests the effectiveness of the management programs carried out as part of the implementation plan. Monitoring must be carried out throughout the life of the TMDL. An adequate monitoring program tracks three components:
 - implementation of BMPs or other controls;
 - water quality improvements; and
 - progress toward meeting water quality standards (targets).

4. National Monitoring Project. Now in its eighth year, this long-term monitoring program evaluates the effects of non-point pollution control measures on water quality in several small Puget Sound watersheds. The project involves monitoring water quality and BMPs over ten years, using paired watershed and single station design. This project, one of about 25 similar concurrent projects around the country, is funded by the U.S. Environmental Protection Agency and carried out by Ecology.
5. Chehalis Fisheries Restoration Program Evaluation Project. Ecology and the U.S. Fish and Wildlife Service are monitoring the effectiveness of fisheries restoration projects in the Chehalis basin. This six-year project involves a variety of monitoring in more than ten sub-basins in the Chehalis watershed. Effectiveness evaluation includes water quality monitoring in wet and dry seasons for bacteria, nutrients, turbidity, total suspended solids, pH, temperature, and conductivity; benthic macroinvertebrate sampling; and continuous dry-season temperature monitoring.
6. Evaluation of forestry rules (BMPs). This has been a highly successful cooperative process over the last 12 years and has resulted in fundamental changes to numerous aspects of the Forest Practices Rules for Washington. New forestry BMPs have been developed and documented in the Forests and Fish report. The legislature has directed the Forest Practice Board to move forward with formal rule adoption. These new rules will set the standard for salmon and water quality protection in the state. They will likely be adopted in 2001. Agencies and tribes will evaluate the effectiveness of these BMPs in the years following implementation, particularly those associated with riparian protection, road management, and exemptions for small landowners.
7. Ground water monitoring of dairy BMPs. The program is conducting a long-term ground water monitoring evaluation of the effectiveness of a dairy waste storage pond in the Beaver Creek sub-basin of the Chehalis River watershed.
8. Other efforts. Many other agencies and local governments are looking at effectiveness. Obviously not all of these efforts have been documented at this time. Additional programs will be recognized in the plan before it goes to final printing.

Question #3: Is the Nonpoint Source Management Plan Effective?

It will be important to assess the effectiveness of the overall plan on a regular basis (every five years) so that changes can be made to add emphasis or refocus efforts where they are most needed. To provide a framework for answering this question, a table of success measures (Table 12.1) has been developed. This table lists the measurements we will use to determine the effectiveness for the State's NPS efforts. Much of this information is required or normally collected as part of agencies' program activities. It also includes "performance measures" for the first two years of the Salmon Recovery Strategy. The list may be modified in the future to support additional information needs and trend analyses.

We have identified performance measures, milestones, monitoring activity, and the reporting agency.

Performance Measures

To evaluate progress toward the plan goal, data from numerous sources will be collated and included in the annual report. Results will be reported as an action that directly or indirectly lead to cleaner water, like implementation of BMPs; or as a measurement of environmental conditions, like actual water quality measurements. The performance measures relate directly to actions listed in Table 9.1.

Milestones

Milestones is the specific measurable outcome that we hope to achieve. If the outcomes are achieved but water quality is still not improving, then we will make revisions to the plan. If outcomes have not been achieved, then we can determine if programs and BMPs have not been implemented and make efforts to correct that, or whether the desired outcomes were unrealistic. Outcomes will be reviewed every year.

Monitoring Activity

Each outcome will be monitored, and results will be reported to Ecology. The type of monitoring activity that is necessary for each specific milestone has been identified.

Reporting Agency

Reporting agency is not necessarily the implementing entity, but is one who is responsible for compiling information.

Table 12.1
Measurements of Success

Plan Action Number	Performance Measures	Milestone	Monitoring Activity	Reporting Agencies
Agriculture				
Ag 13	Dairies inspected	100% of dairies inspected by October 1, 2000	Progress Reports	ECY, CC, NRCS
Ag 13	Dairy nutrient management plans approved; fully implemented	100% of dairies with approved plans by July 1, 2002	Progress Reports	ECY, CC, NRCS
Ag 13	Riparian habitat on agricultural lands that is protected, restored, or preserved.	Milestones will be determined later by the Salmon Recovery Office	Progress Reports	Salmon Strategy
Ag 4	Number of field office technical guides for riparian protection updated	FOTGs updated by December 31, 2001	Progress Reports	CC, NRCS
Ag 7	Quantity of water saved and retained in-stream from irrigation water conservation.	Milestones will be determined later by the Salmon Recovery Office	Ambient Monitoring	Salmon Strategy
Ag 8	Number of pesticide collection events	6 events per year	Progress Reports	WSDA
Ag 13	Farm plans completed statewide	50% of farms by 2003 75% of farms by 2008	Progress Reports	NRCS, CC
Ag 12	Number of landowners served through CRP and CREP contracts	750 landowners by FY2000 2,000 landowners by FY2001	Progress Reports	NRCS, FSA, CC
Ag 12	Number of acres under contract through CRP and CREP	25,000 acres by FY2000 50,000 acres by FY2001 Targets beyond 2001 will be determined later	Progress Reports	NRCS, FSA, CC
Forestry				
For 2	Number of Habitat Conservation Plans	1 HCP per year	Progress	DNR, NMFS,

	approved		Reports	USFWS
For 4	Miles of forest road with approved road maintenance plans	100% of large landowner roads under plan by 2004. Restoration of those roads completed by 2014	Progress Reports	DNR
For 1	Miles of forest riparian areas protected with new "Forests and Fish" buffers.	Miles will be determined by 12/31/2000	Evaluation of BMPs	Salmon Strategy
For 1	New Forest Practice regulations adopted	Regulations adopted in June 2001	Progress Reports	DNR
For 1	New emergency Forest Practices regulations adopted	Emergency Rules adopted in January 2000	Progress Reports	
For 6	Miles of federal roads repaired or abandoned	Milestone will be established through compliance schedules contained in the proposed US Forest Service MOA revisions	Evaluation of BMPs	USFS
Urban				
Urb 23	Percent of state highways that meet new stormwater requirements	Number of additional miles per year will be determined later	Progress reports	WSDOT
Urb 1	Number of Counties and cities planning under GMA	Target numbers for 2003 will be determined by DCTED	Progress Reports	DCTED
Urb 1	Percent of local governments that implement key salmon recovery recommendations and requirements	Percent targets have not been determined yet	Progress Reports	Salmon Strategy
Urb 6	Number of communities within Puget Sound that have met target dates for implementing the Puget Sound Water Quality Management Plan	All communities to meet target dates by 2000	Progress Reports	PSWQAT, ECY, locals
Urb13	Number of on-site operation and maintenance programs implemented	All counties to begin implementing by 2005	Progress Reports	DOH, PSWQAT
Urb 13	New on-site technologies approved and promoted	Process for review and approval of new technologies developed by June 2000	Progress Reports	DOH
Urb 11	Number of communities within Puget Sound that have met target dates for adopting onsite	All communities to meet target dates by 2000	Progress Reports	PSWQAT DOH

	operation and maintenance programs			
Urb 4	Washington State Stormwater Management Manual approved	Manual approved in year 2000	Progress Reports	
Hydromodification				
Hyd 1	Integrated Stream Corridor Guidelines	Guidelines adopted in 2000	Progress Reports	ECY, DOT, WDFW
Hyd 3	Develop technical guidance for salmon restoration projects	Timeline and content will be determined by the SRO	Progress Reports	Salmon Strategy
Recreation				
Rec 3	ORV facilities with water quality plans	2 new ORV facilities per year	Progress Reports	IAC, counties DNR
Rec 7	Marinas with operating marine sanitation pump-outs	10 new marinas by 2003	Progress Reports	Parks
Loss of Aquatic Ecosystems				
LAE 8	Lakes in monitoring network that meet water quality standards	25% of lakes by 2008; 50% of lakes by 2013	Project Monitoring	ECY
LAE 11	Riparian areas restored through JFE and WCC programs	25 miles restored per year	BMP Evaluation	ECY, DNR
LAE 12	Rivers and streams have sufficient clean, cool water to support salmonids. Riparian and estuarine habitat protected and restored.	Miles of riparian and freshwater habitat to be determined by the Salmon Recovery Office	Ambient Monitoring	Salmon Strategy
LAE 6 and 7	Net gain of wetlands function and acreage and of other aquatic and riparian habitat	Net increase to be determined by the Salmon Recovery Office	Progress Reports	Salmon Strategy
Education				
Ed 6	Watershed-specific Project WET teacher workshops conducted	10-15 workshops/year	Progress Reports	ECY
Ed 7	Columbia Watershed curriculum	Curriculum completed by the end of 2000	Progress Reports	GCEE
Ed 8	Magic Apple teacher grants awarded	9 grants/year	Progress Reports	ECY
Ed 9	Children's water festivals sponsored	1 festival/year	Progress Reports	ECY with local

			Reports	agency
Ed 13	Campaigns and materials for narrowly focused target groups	1 new audience targeted/year	Progress Reports	ECY
Ed 14	Number of Master Watershed Steward programs taught; number of hours donated by trained volunteers on stewardship projects	16 classes of 25 people each /year; 75 hours contributed per graduate; =30,000 hours/year or 120,000 hrs by the end of 2003.	Progress Reports	GCEE
Ed 18	Online, central repository for volunteer monitors' data completed and operating/number of datasets of known quality entered into repository	100 data sets entered/year	Progress Reports	ECY
Ed 17	Provide technical help for volunteer monitors	Every question answered	Progress Reports	ECY
Ed 10	Public Information and Education ("PIE") grants funded	25grants per biennium	Progress Reports	PSAT
General Needs				
Gen 2	Number of Watershed Management Act (2514) Plans approved with water quality element	15 plans approved by December 31, 2003	Progress Reports	ECY
Gen 5	Number of Total Maximum Daily Loads submitted to EPA	249TMDLs submitted by 2003 552TMDLs submitted by 2008 765TMDLs submitted by 2013	Progress Reports	ECY
Gen 10	Number of Shellfish upgrades and re-certification status	10,000 acres recertified by 2008	Project Monitoring	DOH
Na	State Agency Workgroup formed and meets annually	2 meetings per year	Progress Reports	State agencies
Gen 18	Water quality conditions for temperature, pH, fecal coliform, and dissolved oxygen	10 % of ambient monitoring sites report no violations by 2009. 25% of ambient monitoring sites report no violations by 2013.	Ambient Monitoring	ECY
Gen 18	Sample failure rates at ambient monitoring sites for bacteria, temperature, pH, and dissolved oxygen in rivers	25% reduction in sample failure rates by 2009; 50% reduction in sample failure rates by 2013.	Ambient Monitoring	All

Gen 19	Salmon recovery regions with regional response plans approved by the Salmon Recovery Office and NMFS	Numbers have not yet been established	Progress Reports	Salmon Strategy
na	State and Fed grant, loan and contract funding for NPS projects, Watershed Planning and salmon recovery efforts	>\$120 million per year from 2000 - 2013	Progress Reports	ECY, DNR, EPA, IAC, CC, DOT, WDFW, NRCS, BPA, NMFS, FWS, USFS, DCTED, FSA, NOAA
na	Meet all 5 year CZARA obligations Meet all 15 year CZARA obligations	Met by year 2004 Met by year 2013	Progress Reports	ECY
Gen 24	NPS enforcement actions	200 actions/year from 2000 - 2013	Progress Reports	WDFW, DNR, ECY, locals
na	Nonpoint Plan on Ecology web site and cross referenced by other resource agencies	Plan available by 2/2000, updated 2/2005, 2/2020, 2/2014	Progress Reports	Agencies, Tribes

Agency Progress Reports

Each agency participating in this plan implementation will be asked to submit an annual report to Ecology describing the following:

1. Efforts to implement activities they have agreed to implement in Chapter 9;
2. Success measures describe in this chapter;
3. Any significant changes to implementation or funding of existing programs.

Reporting on progress on cooperative efforts involving other entities not part of the State Agency Workgroup will also be expected. The Salmon Recovery Office will report on performance measures identified in the Salmon Recovery Strategy.

All the information gathered will be annually tabulated by Ecology and used by State Agency Workgroup to make decisions about overall Plan effectiveness. It will also be made available to the general public using the Ecology web site.

Question #4: What changes in strategy are needed to improve effectiveness?

The State Agency Workgroup will meet annually to accomplish the following:

1. Review water quality reports
2. Review various implementation reports (as available)
3. Review progress on implementation commitments (Chapter 9)
4. Collaborate on new ideas for solving nonpoint source pollution
5. Advise Ecology on changes needed to the 319 plan

This will also be a good opportunity to coordinate nonpoint control programs and co-manage data.

It is likely that commitments in the plan will need to be revisited throughout the plan implementation period (five years). Many of the commitments are actions that have a high likelihood of being carried out because the program already exists and the funding sources are relatively assured. In a number of cases, actions identified in the plan are limited by funding or by the need for many entities to participate in the outcome. In these cases, the progress will be difficult to predict. These annual reviews will be important to make sure the overall plan direction is maintained.

Five years and beyond

The actions identified in the plan will require a long-term commitment from federal, tribal, state, local and private resources. There is no quick fix to pollution that is as endemic as nonpoint pollution. Although the scope of this plan is actions to be taken within five years, the framework and efforts embodied in the plan will continue many

more years. During the five years of this plan, the focus of many agencies will be to develop the necessary programs to implement the actions in the plan. Each agency will determine its own timeline for the actions, and report the timeline to the State Agency Workgroup. Ecology will track these timelines and project completion for the Workgroup. The Workgroup will also coordinated the timing of inter-related actions.

As programs are developed, they will implemented on the ground by the appropriate groups, as needed. For example, landowners will put in place BMPs, agencies will provide technical and financial assistance when possible. Examples of this program development follow:

Ag 12: Actively engage agricultural producer groups in developing and implementing Best Management Practices. During program development, such as issues as agency roles, the process for approving BMPs, the linkage to the State Revolving Fund, and prioritization of BMPs for implementation will be addressed. In essence, a turn-key operation will be produced that can be customized for each commodity group. Commodity groups will then be approached to develop their BMPs. This process has already been done on a pilot basis, and several deficiencies were identified. Program development will eliminate these deficiencies.

Some 250 agricultural commodities are grown within Washington State. Developing BMPs will require differing amounts of time depending on the size of the commodity group and the complexity of the crop's growth patterns. Beyond the five years, additional commodity groups will be sought, thereby increasing the coverage of agreed upon BMPs until all appropriate groups have established and implemented approved BMPs.

Rec 7: Update the Comprehensive Boat Sewage Management Plan for Washington State. This plan governs the placement of marine sewage facilities in the state. Criteria are established for placement and prioritization of facilities. Timelines are set for the construction of facilities and issues such as required match and maintenance are addressed in the plan. The update of the plan will occur within five years.

Beyond five years, Parks will market the program, and fund the placement of facilities in accordance with the plan until sufficient facilities are available to significantly reduce or eliminate this source of nonpoint pollution.

In addition, the various planning processes such as TMDLs, local watershed plans under chapter 90.82 RCW, salmon recovery limiting analyses under the Salmon Recovery Act, and Puget Sound Watershed Plans under chapter 400-12 WAC (or their equivalent outside the Puget Sound area) will continue to investigate and identify water quality problems across the state. This plan will provide a toolbox of programs to be used in these areas to address the identified problem. The plan also provides a mechanism through the consistent review process and other feedback to develop programs to address unmet needs that may arise.

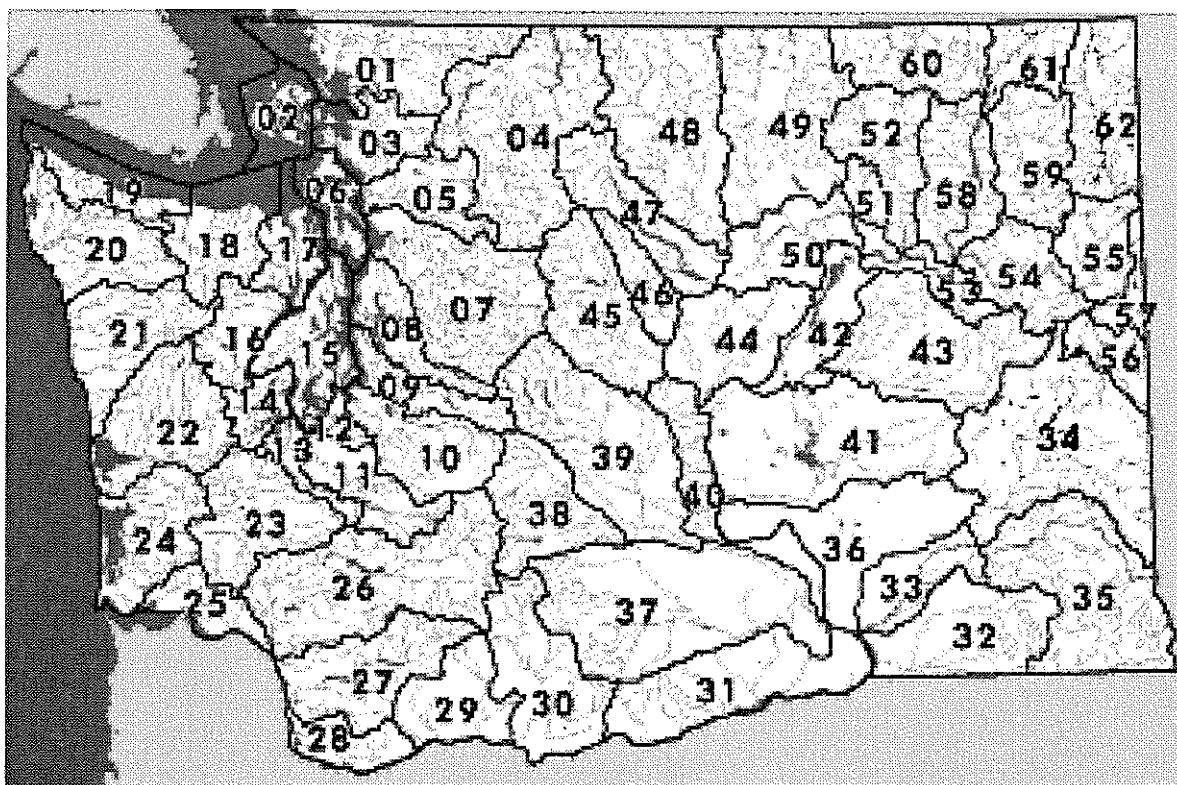
In summary, during the five years of this plan, agencies will develop the programs necessary to implement the actions identified in the plan, and implement where possible.

Beyond five years, programs will be implemented to the maximum extent needed and where possible within the state, and additional programs will be developed and implemented to manage future identified needs.

Every five years this plan will be updated, including another analysis of management measures. The need for major changes in strategy will be identified at that time. We will again use a coordinated approach for the update.

Washington's NPS Management Plan is a living document. EPA and NOAA require a review and update of the plan on a five-year cycle. The plan is directed to meet the 15-year goal of full implementation of CZARA management measures by 2013. Therefore, all actions indicated as meeting a CZARA management measure must be completed for Washington to be in compliance with CZARA.

The actions of the plan, when taken as a whole, will focus resources in a manner that widens program implementation, improves program effectiveness, and attends to problems not previously addressed. Through increased coordination and cooperation, we can improve the quality of the state's waters and maintain and improve our quality of life.



Washington's
Water Quality Management Plan
to Control
Nonpoint Sources of Pollution

Appendix A

Washington State Department of Ecology
January, 2000
Publication # 99-26

Water Quality Summaries for the 62 Water Resource Inventory Areas of Washington State

William A. Hashim

Washington State Department of Ecology
January, 2000

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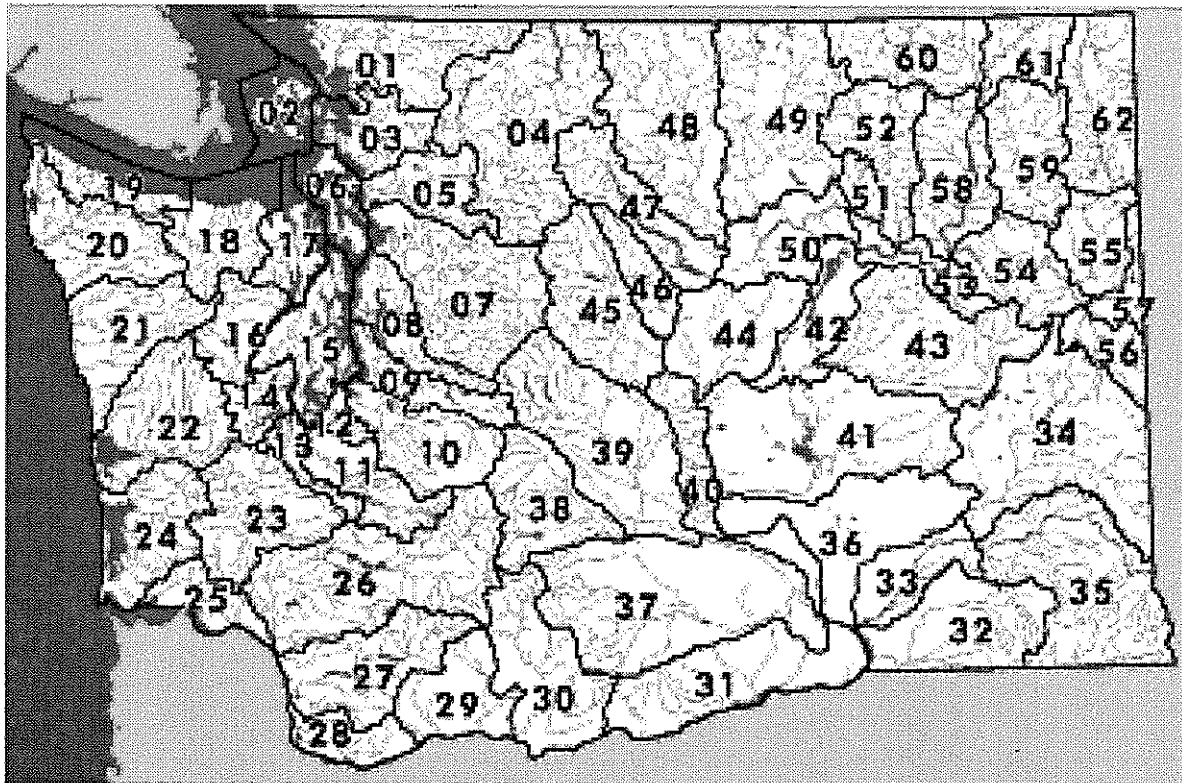
For color copies of the WRIA summaries contained in this document, please visit the
Department of Ecology web site at the address below:

www.wa.gov/ecology/biblio/9926.html

Appendices

- A. Water Quality Summaries
- B. Memorandum of Agreement between Ecology and US Forest Service
- C. Local Priority Setting Process
- D. Responsiveness Summary
- E. Letters of Concurrence from Implementing Agencies

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Introduction

Section 319 of the Federal Clean Water Act requires each state to develop water quality management plans for controlling nonpoint sources of pollution. In order to fulfill the federal mandate of section 319, a list of 9 key elements for an effective program were identified by the Association of State and Interstate Water Pollution Control Administrator's and adopted by the Environmental Protection Agency.

One of the elements requires state's to identify:

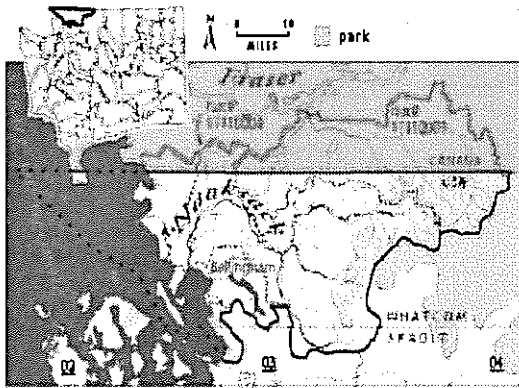
- waters and their watersheds impaired by nonpoint source pollution;
- the primary categories and subcategories causing the water quality impairment;
- land uses; and
- water quality programs to abate pollution.

Using these as a starting point, it was decided to expand the information beyond an administrative requirement and make it a useful document to watershed planners at the local and state level. Watershed planning in Washington State has reached a level of interest and emphasis from all sectors of society. People of the state expect to have cool, clean water. The best way to insure that is through watershed planning at the local level in which all interested parties who have a vested interest in water quality are allowed to participate.

These water quality summaries for all 62 water resource inventory areas (WRIAs) can be used as a starting place in understanding the relationship between demographics and water quality problem areas. Hopefully, this document can be upgraded on an annual or biannual basis.

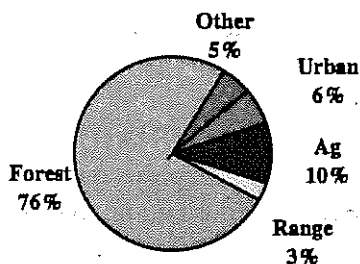
An explanation of where the information came from

Nooksack Basin - WRIA #1



Demographics

Land Use in Nooksack Basin



and use information came from Appendix A of the 1994 State Water Quality Assessment 305(b) Report

Land Base (in acres)

The source for acreage comes from DNRs Public Lands Survey. Total WRIA acreage minus public lands yielded total private lands.

Principal economic activity (as total wages)

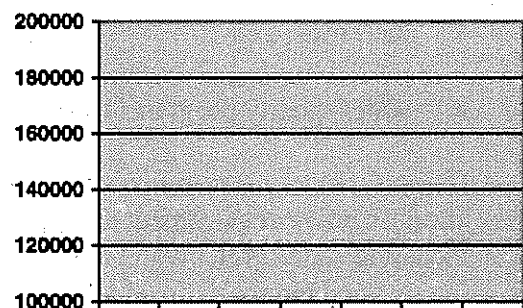
Wage figures come from OFMs 1997 Handbook on State Statistics. The numbers were by county and extrapolated as best-as-

Appendix A - Water Quality Summaries

possible to fit WRIAs. Often, wages earned did not mesh with the major land use. For example, in the Palouse, agriculture is the major land use, but the majority of wages earned came from the government sector.

Population

Projected population trends



The population figures and growth trends came from OFM. In a number of cases, it seemed that growth was extraordinary, however, since there were no better numbers to go by, OFM's were used.

Counties

Special purpose districts

Principal Cities

Reservation Lands

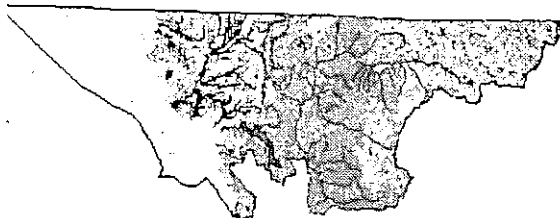
Only tribal reservation lands were listed and not U and A lands.

Environment

This description mostly came from Ecoregions of the Pacific Northwest, Omernik et al. At times, the general description of the ecoregion did not fit

the unique description of a WRIA. These were changed when comments were received.

303(d) Listed Waterbodies



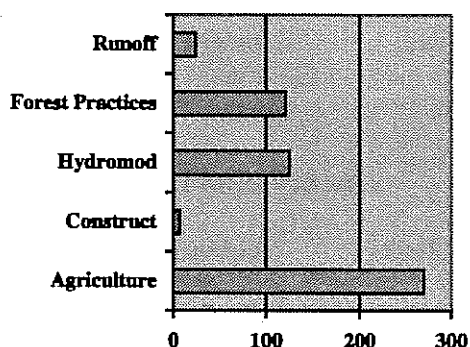
Total Maximum Daily Loads

TMDLs were required for all water bodies impacted by pollutants identified in the 1998 303(d) report.

303(d) listed Problem Areas

This list identifies waterbodies impacted by both pollutants and pollution. Only those water bodies impacted by pollutants required a TMDL. Beneficial uses impacted by pollution did not require a TMDL.

Stream Miles Impacted by Source



This information came from Appendix A of the 1994 State Water Quality Assessment 305(b) Report.

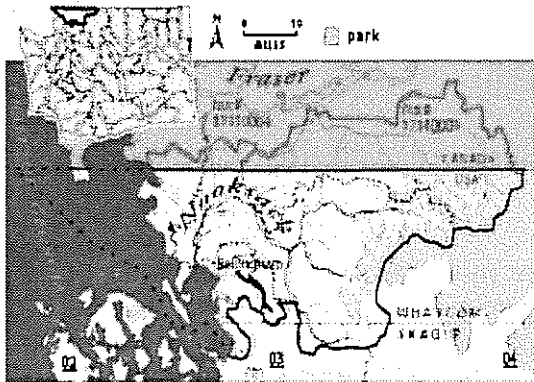
Unified Watershed Assessment Priority Concerns

On August 5, 1998, Ecology convened a workgroup of federal, state, tribal, and local parties that have regulatory or management responsibilities for water quality or related resources. The purpose was to develop a cooperative, or "unified" approach to watershed protection. This category list the priority concerns identified by that workgroup.

Water Quality Programs in WRIA #1

Most of this information came from "Jobs for the Environment" files and from Ecology's Centennial Clean Water Fund data. Over 250 copies of the draft summaries document were mailed asking for information about water quality programs for each WRIA. However, since very few comments were received, there are many federal, state, and local water quality efforts not captured. Hopefully the next iteration of this document will be more accurate and complete.

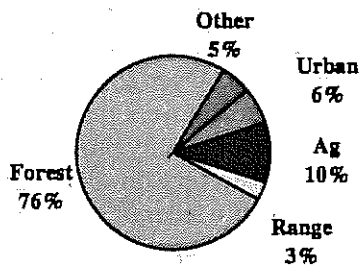
Nooksack Basin - WRIA #1



WRIA #1 encompasses about 1,039,283 acres, with more than 1,000 miles of rivers and streams. The eastern third is mountainous and heavily forested. The western portion is a broad floodplain.

Demographics

Land Use in Nooksack Basin



Land Base (in acres)

Federal	270,392	26%
State	102,758	9.9%
Local	302	.03%
Tribal	13,241	1.3%
Private	652,590	62.8%

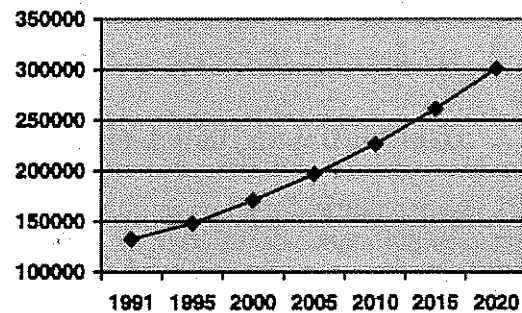
Principal economic activity (as total wages)

Agriculture/Forestry	4%
Manufacturing	15%
Retail Trade	22%
Services	25%
Government	15%

Population

There are approximately 148,300 people living in the Nooksack River Basin. The primary population centers are Bellingham, Lynden, and Ferndale. The majority of people live in unincorporated areas.

Projected population trends



Counties

Whatcom (94%)
Skagit (6%)

Special purpose districts

Conservation Districts: Whatcom; Skagit

Shellfish Protection Districts: Portage Bay
Drayton Harbor

Principal Cities

Bellingham	Ferndale
Lynden	Blaine
Everson	Sumas

Reservation Lands

Lummi Tribe Nooksack Tribe

Environment

Part of the Fraser lowlands, this WRIA has undulating glacial drift plains, terraces, and floodplains with low gradient meandering rivers and streams. Surface material is

deep to moderately deep silt to sandy loam. Potential natural vegetation is western hemlock, western red cedar, and some red alder. Mean temperature ranges from 33/44° (winter) to 50/73° (summer).

303(d) Listed Waterbodies



Total Maximum Daily Loads

116 TMDLs required from the 1998 303(d) list

303(d) listed Problem Areas

Fecal coliform in Anderson Ditch, Clearbrook Creek, Dakota Creek, Deer Creek, Fishtrap Creek, Kamm Creek, Silver Creek, and Sumas Creek, and others

High temperature in Anderson Creek, Boulder Creek, Canyon Creek, Cavanaugh Creek, Cornell Creek, Gallop Creek, Whatcom Creek, and Nooksack River, and others

Dissolved oxygen in Anderson Creek, Bertrand Creek, Dakota Creek, Clearbrook Creek, Deer Creek, Johnson Creek, Kamm Creek, Silver Creek, Sumas Creek, and Lake Whatcom

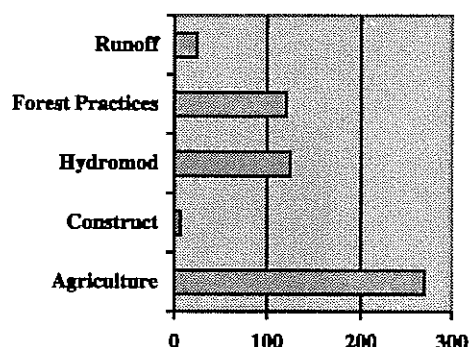
Metals in Bellingham Bay, Nooksack River, and Straights of Georgia

Fine sediments in Anderson Creek, Howard Creek, Nooksack River, and Racehorse Creek

pH in Deer Creek, Kamm Creek, Mormon Ditch, Pangborn Creek, Squaw Creek, and Drayton Harbor

Low flows in Bertrand Creek, Fishtrap Creek, and Nooksack River

Stream Miles Impacted by Source



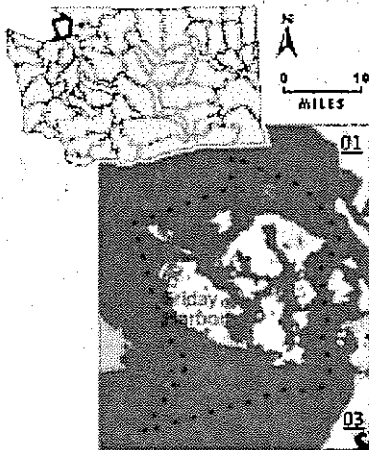
Unified Watershed Assessment Critical Environmental Information

Water	
Flow	Impaired
Quality	Healthy
TMDLs	In process
Public Health	
Shellfish	Threatened
Drinking Water	Healthy
Nitrates	Impaired
Fish	Threatened

Water Quality Programs in WRIA #1

1. **Stormwater plans** for Blaine, Everson, Ferndale, Lynden, Nooksack, and Sumas
2. **Watershed plans** for Silver Creek, Tenmile Creek, Kamm Creek, and Drayton Harbor watersheds
3. **TMDLs** for Fishtrap Creek.. Lower Nooksack TMDL underway.
4. **Lake restoration** plan for Lake Whatcom
5. US Forest Service Northwest Forest Plan
6. Local On-site Sewage System Loan Program, Whatcom County Health
7. Whatcom County Shellfish Protection Plan, Whatcom CD
8. Chuckanut Bay On-Site/Shellfish Project, Whatcom County Health

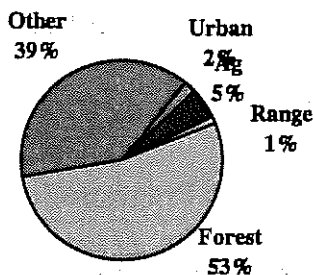
San Juan Basin - WRIA #2



WRIA #2 encompasses about 399,625 acres. The climate is influenced by maritime air masses and the rain shadow effect of the Olympic Mountains. The islands are part of the Puget Lowlands ecoregion.

Demographics

Land Use in the San Juan Basin



Land Base

Federal	2,274	.6%
State	8,767	2.2%
Local	91	.02%
Tribal	-0-	-0-
Private	388,493	97.2%

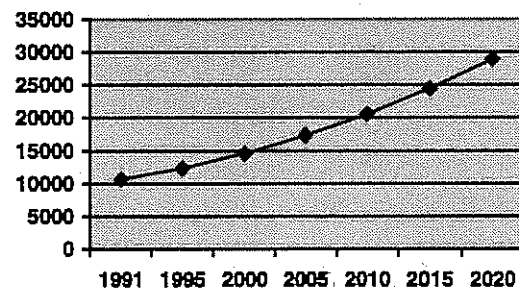
Principal Economic Activity (as total wages)

Agriculture/Forestry	3%
Construction	10%
Retail Trade	23%
Services	29%
Government	19%
Other	16%

Population

There are approximately 12,300 people living in the basin. The primary population centers are Friday Harbor, Lopez, and Eastsound. The majority of people live in unincorporated areas.

Projected population trend



Counties

San Juan (100%)

Special purpose districts

San Juan County Conservation District

Principal Cities

Friday Harbor
Lopez
Eastsound

Reservation Lands

None

Environment

The San Juan Islands are glacial scoured islands with small intermittent streams and limited surface water. Surface material is very gravelly silt loam to gravelly loam. Potential vegetation is Douglas Fir, grand fir, and some oak. Mean temperature ranges from 36/46° (winter) to 52/62° (summer).

303(d) listed waterbodies



Total Maximum Daily Loads

1 TMDL required from the 1998 303(d) list

303(d) listed Problem Areas

Fecal coliform bacteria in Friday Harbor

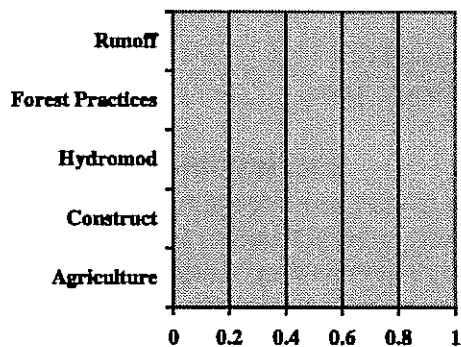
Low Dissolved Oxygen in East Sound

Unknown water quality impacts from the many marinas.

The degree of nitrate contamination of ground water is unknown

Some near-shoreline chloride ground water contamination due to aquifer sea-water intrusion

Stream Miles Impacted by Source



None identified

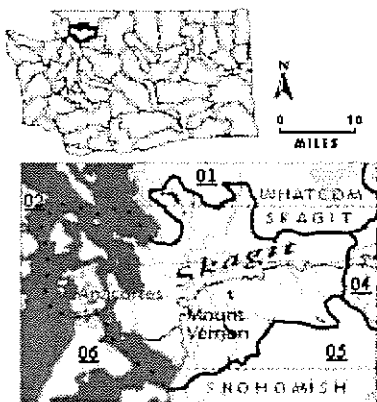
Unified Watershed Assessment Critical Environmental Information

Water	
Flow	Impaired
Quality	Threatened
TMDLs	None
Public Health	
Shellfish	No concerns
Drinking Water	No concerns
Nitrates	None
Fish	Not Threatened

Water Quality Programs in WRIA #2

1. San Juan Island Watershed Action Plan, San Juan County
2. Water quality assessment of Trout Lake. Trout Lake supplies water to Friday Harbor, San Juan County
3. On-site septic system assistance program to aid homeowners with failing septic systems, San Juan County

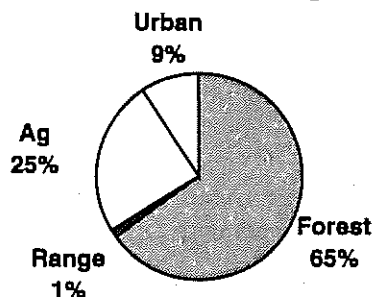
Lower Skagit-Samish Basin - WRIA 3



The Lower Skagit encompasses about 474,226 acres, mostly within the Cascade Ecoregion. The annual precipitation is 37 inches per year.

Demographics

Land Use in the Lower Skagit



Land Base

Federal	7,788	1.6%
State	60,931	12.9%
Local	488	.1%
Tribal	7,304	1.5%
Private	397,718	83.9%

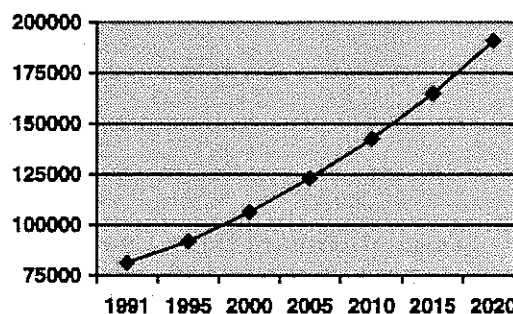
Principal Economic Activity (as total wages)

Agriculture/Forestry	9%
Manufacturing	12%
Retail Trade	23%
Services	20%
Government	20%
Other	16%

Population

There are approximately 91,699 people living in the Lower Skagit-Sammish Basin. The primary population centers are Mount Vernon and Anacortes.

Projected population trends



Counties

Skagit (94%) Whatcom (4%)
Snohomish (2%)

Principal Cities

Mount Vernon Anacortes
Sedro-Woolley Burlington
La Conner Lyman

Special purpose districts

Conservation Districts: Skagit; Whatcom; Snohomish

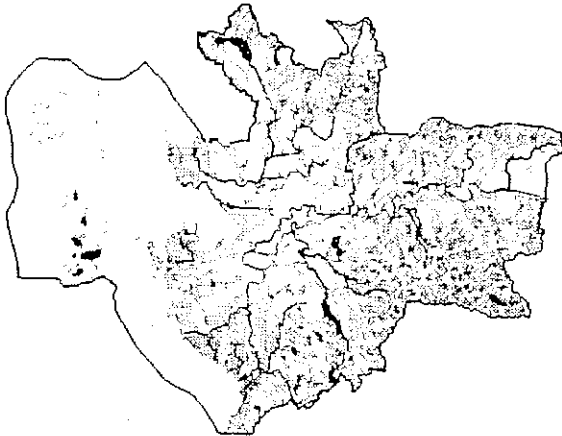
Reservation Lands

Swinomish Tribe
Upper Skagit Tribe

Environment

Rolling moraines and foothills, floodplains and meandering rivers characterize the lower Skagit. Surface material is deep fertile silt loam to very gravelly sandy loam. Potential natural vegetation is western hemlock, western red cedar, red alder, and some Douglas fir. Mean temperature is 36/46° (winter) to 52/62° (summer).

303(d) listed waterbodies



Total Maximum Daily Loads

21 TMDLs required from the 1998 303(d) list

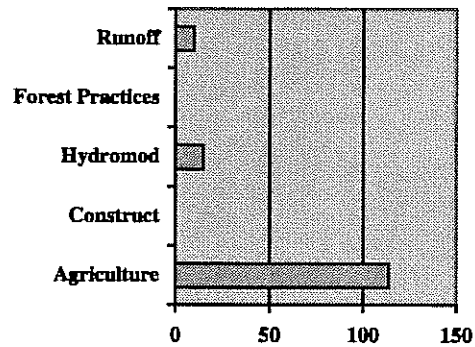
303(d) listed Problem Areas

Fecal coliform in Browns Slough, Carpenter Creek, Friday Creek, Hansen Creek, Indian Slough, Joe Leary Slough, Nookachamps Creek, Samish River, and Skagit River

High temperatures in Carpenter Creek, Coal Creek, Cumberland Creek, Day Creek, Fisher Creek, Hansen Creek, Indian Slough, Joe Leary Slough, Nookachamps Creek, Red Creek, and Turner Creek

Dissolved oxygen in Indian Slough, Joe Leary Slough, and Noname Slough

Stream Miles Impacted by Source



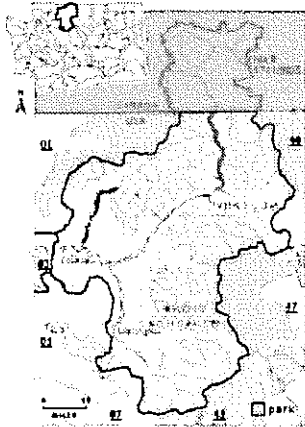
Unified Watershed Assessment Critical Environmental Information

Water	
Flow	Healthy
Quality	Threatened
TMDLs	In process
Public Health	
Shellfish	Impaired
Drinking Water	Concerns
Nitrates	Healthy
Fish	Threatened

Water Quality Programs in WRIA #3

1. Nookachamps Watershed Action Plan, 1994 - Skagit County
2. Samish Bay Watershed Action Plan, 1994 - Skagit County
3. Samish Bay Shellfish Closure Response Strategy, 1995 - Skagit County
4. Hansen Watershed Analysis, 1994
5. Effects of BMPs on Suspended Sediments, Skagit CD
6. Lower Skagit River Watershed Plan, Skagit County
7. Guemes Island Comprehensive Ground Water Study, Skagit CD
8. Forestry for Clean Water, Skagit CD

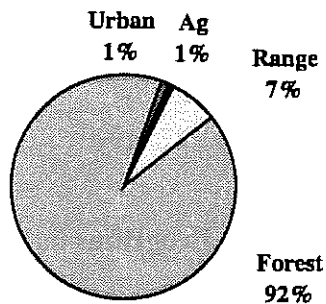
Upper Skagit Basin - WRIA #4



WRIA #4 encompasses about 1,565,856 acres. It is mountainous and heavily forested, and is mostly contained in the Cascade ecoregion. This WRIA receives nearly 100 inches of rainfall per year.

Demographics

Land use in the Upper Skagit



Land Base (in acres)

Federal	1,358,357	86.8%
State	46,727	3.0%
Local	-0-	-0-
Tribal	-0-	-0-
Private	160,772	10.2%

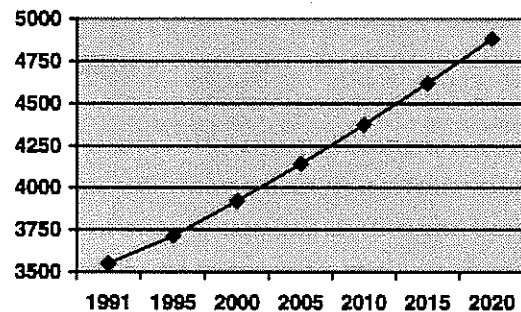
Principal Economic Activity (as total wages)

Agriculture/Forestry	17%
Manufacturing	12%
Retail Trade	15%
Services	20%
Government	20%
Other	16%

Population

There are approximately 3,711 people living in the Upper Skagit Basin. The primary population centers are Darrington and Concrete. The majority of people live in unincorporated areas.

Projected population trends



Counties

Whatcom (39%) Skagit (38%)
Snohomish (23%)

Special purpose districts

Conservation Districts: Whatcom; Skagit; Snohomish

Principal Cities

Darrington
Concrete

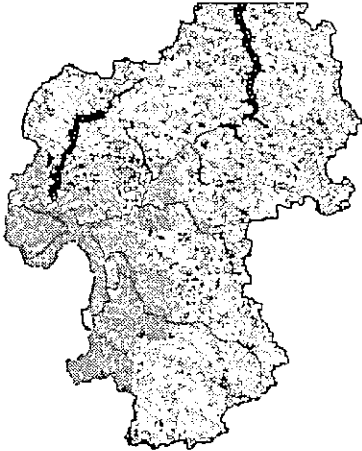
Reservation Lands

Sauk-Suiattle Tribe

Environment

High glaciated ridges, plateaus, and U-shaped valleys characterize this basin. Surface material is very deep sandy, gravelly loams to undifferentiated bare rock and rubble. Potential natural vegetation is Pacific fir, subalpine fir, Douglas fir, and other mixed conifers. Mean temperature is 13/36° (winter) to 45/70° (summer).

303(d) listed waterbodies



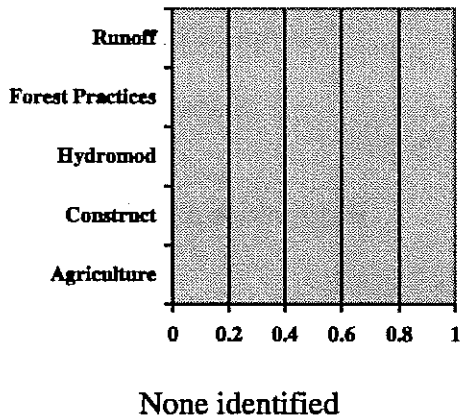
Total Maximum Daily Loads

0 TMDLs required from the 1998 303(d) list

303(d) listed Problem Areas

High temperature in Finney Creek, Grandy Creek, and Jackman Creek

Stream Miles Impacted by Source



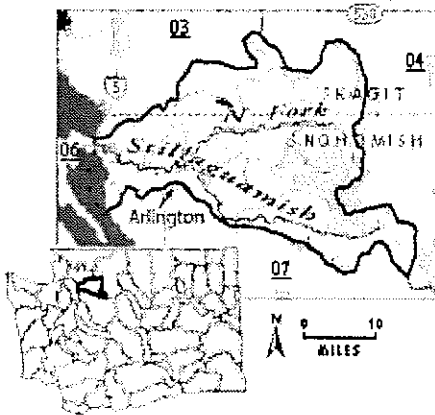
Unified Watershed Assessment Critical Environmental Information

Water	
Flow	Healthy
Quality	Healthy
TMDLs	None
Public Health	
Shellfish	None
Drinking Water	Healthy
Nitrates	Healthy
Fish	Healthy

Water Quality Programs in WRIA #4

1. US Forest Service Northwest Forest Plan
2. Water Quality Education for Farmers, Skagit CD
3. Skagit Watershed Rehabilitation, Skagit CD

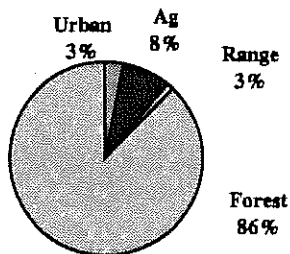
Stillaguamish Basin - WRIA #5



WRIA #5 is located in northern end of Puget Sound and is part of the Puget Sound Lowlands. The drainage area is about 459,938 acres, the average annual precipitation is 69 inches per year.

Demographics

Land use in the Stillaguamish



Land Base (in acres)

Federal	176,178	38.3%
State	71,659	15.6%
Local	-0-	-0-
Tribal	101	.02%
Private	212,000	46.1%

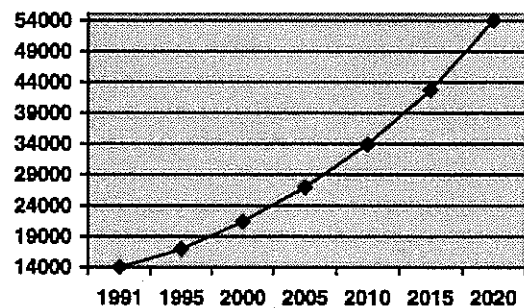
Principal Economic Activity (as total wages)

Agriculture/Forestry	2%
Construction	6%
Manufacturing	28%
Retail	19%
Services	19%
Government	15%

Population

There are approximately 16,955 people living in the Stillaguamish Basin. The primary population center is Arlington. The majority of people live in unincorporated areas.

Projected population trends



Counties

Snohomish (73%)
Skagit (27%)

Special purpose districts

Conservation Districts: Snohomish; Skagit
Drainage District #7
Snohomish County Clean Water District
Stillaguamish Flood Control District

Principal Cities

Arlington Stanwood
Granite Falls

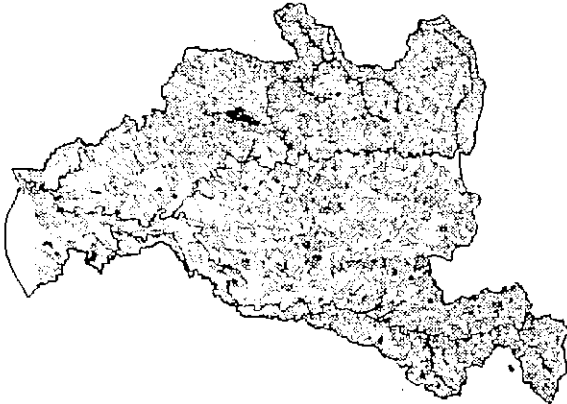
Reservation Lands

Stillaguamish Tribe

Environment

Rolling moraines and foothills, floodplains and meandering rivers characterize the lower Skagit. Surface material is very gravelly sandy loam. Potential natural vegetation is western hemlock, western red cedar, red alder, and some Douglas fir. Mean temperature is 36/46° (winter) to 52/62° (summer).

303(d) listed waterbodies



Total Maximum Daily Loads

18 TMDLs required from the 1998 303(d) list

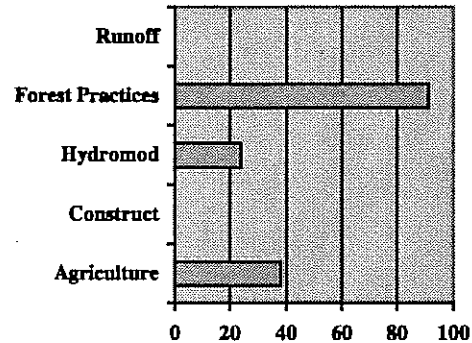
303(d) listed Problem Areas

High temperatures in Deer Creek, Little Deer Creek, Higgins Creek, Pilchuck Creek, and Stillaguamish River

Fecal coliform in Fish Creek, Harvey Creek, Jorgenson Slough, Martha Lake Creek, Old Stillaguamish River, Portage Creek, and Stillaguamish River

Dissolved oxygen in Portage Creek and Stillaguamish River

Stream Miles Impacted by Source



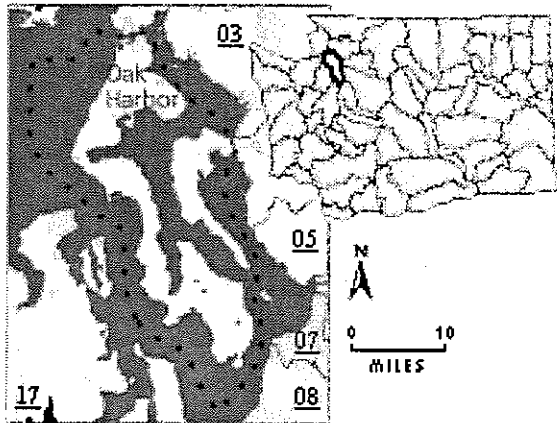
Unified Watershed Assessment Critical Environmental Information

Water	
Flow	Healthy
Quality	Healthy
TMDLs	In process
Public Health	
Shellfish	Impaired
Drinking Water	Healthy
Nitrates	Healthy
Fish	
	Threatened

Water Quality Programs in WRIA #5

1. Swamp Creek Watershed Action Plan - Snohomish County
2. Swamp Creek Watershed Stewards - Snohomish County
3. US Forest Service Northwest Forest Plan
4. On-site System Education, Snohomish County Health
5. West Snohomish County Ground Water Management, Snohomish County
6. Stillaguamish Basin Restoration and Monitoring, Snohomish County
7. Stillaguamish Watershed Coordinator, Snohomish County

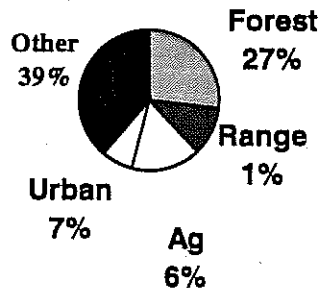
Island Basin - WRIA #6



WRIA #6 encompasses about 332,471 acres. The island is part of the Puget Lowland ecoregion. Average annual rainfall is nearly 18 inches a year.

Demographics

Land Use in Island County



Land Base (in acres)

Federal	8,055	2.4%
State	6,109	1.8%
Local	-0-	-0-
Tribal	-0-	-0-
Private	318,307	95.8%

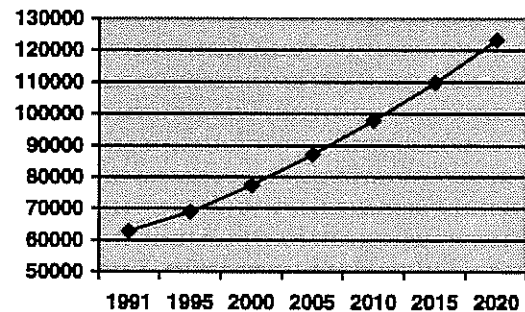
Principal Economic Activity (as total wages)

Agriculture	2%
Retail Trade	23%
Services	24%
Government	32%
Construction	5%
Other	14%

Population

There are approximately 68,900 people living in the Island Basin. The primary population centers are Oak Harbor, Coupeville, and Langley. The majority of people live in unincorporated areas.

Projected population trends



Counties

Island (100%)

Special purpose districts:

Whidbey Island Conservation District

Principal Cities

Oak Harbor Coupeville
Langley

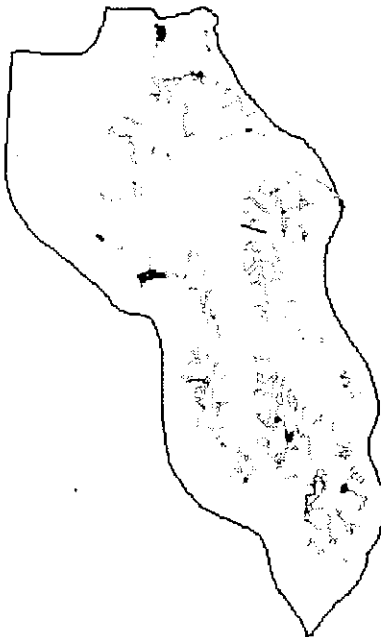
Reservation Lands

None

Environment

Rolling glacial till plains with small, low to medium gradient streams. Surface material is moderately deep, gravelly sandy loam. Potential vegetation is western hemlock, western red cedar, and Douglas fir. Mean temperature is 36/45° (winter) to 51/64° (summer).

303(d) listed waterbodies



Total Maximum Daily Loads

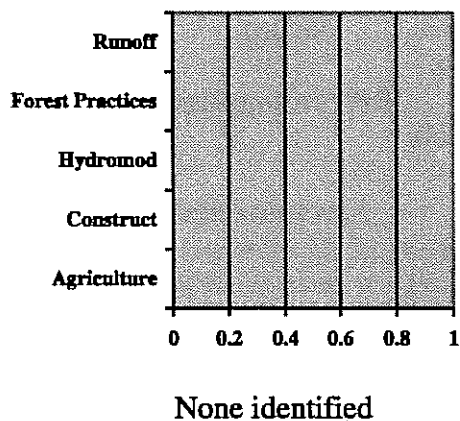
0 TMDLs required from the 1998 303(d) list

303(d) listed Problem Areas

Fecal coliform in unnamed creek WDF 05.0456, Port Susan, and Skagit Bay

Dissolved oxygen in Skagit Bay and Similk Bay

Stream Miles Impacted by Source



Unified Watershed Assessment Critical Environmental Information

Water	
Flow	Healthy
Quality	Threatened
TMDLs	None
Public Health	
Shellfish	Healthy
Drinking Water	Healthy
Nitrates	Healthy
Fish	Healthy

Water Quality Programs in WRIA #6

1. North Whidbey Watershed Action Plan - Island County
2. South Whidbey Watershed Action Plan - Island County
3. Nitrate Contamination Assessment, Island County Health
4. Whidbey Septage Treatment Program, Island County Health

The map shows the northern coast of the Northwest Territories, Canada. It includes the locations of Tuktoyaktuk, Repulse, and Inuvik. The map is labeled with '05', '06', '04', '42', '08', and '39'. A scale bar indicates 0 to 10 miles, and a north arrow is present. An inset map shows the location of the study area within the Northwest Territories.

Demographics

Land Use Type	Percentage
Forest	83%
Urban	6%
Other	4%
Ag	4%
Range	3%

Federal	459,155	37.7%
State	147,578	12.0%
Local	12,879	1.0%
Tribal	20,468	1.7%
Private	581,737	47.6%

Agriculture/Forestry	2%
Construction	6%
Manufacturing	28%
Retail	19%
Services	19%
Government	15%

There are approximately 290,747 people living in the Snohomish River Basin. The primary population centers are Everett, Monroe, Mukilteo, and the North Bend/Snoqualmie area. The majority of people live in unincorporated areas.

Year	Number of people aged 65 and over (thousands)
1991	270,000
1995	290,000
2000	315,000
2005	345,000
2010	375,000
2015	410,000
2020	450,000

Snohomish (51%) King (49%)

Conservation Districts: Snohomish; King
Diking Districts #2, #3, #4, #5
Drainage Districts #6, #8, #13
French Slough Flood Control District
Marshland Flood Control District
Patterson Flood Control Zone District

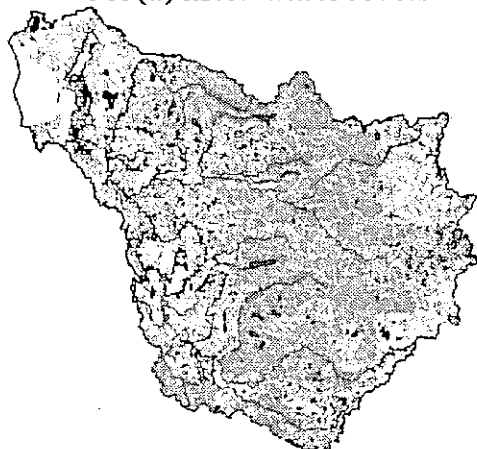
Everett	Monroe
Marysville	Duvall
Mukilteo	Lake Stevens
Snohomish	North Bend
Snoqualmie	Sultan
Carnation	

Tulalip Tribe

This basin has rolling moraines and foothills in the west, and low mountains with broad glaciated valleys in the east. Moderately deep silt loam to gravelly silt loam make up the surface material. Potential natural vegetation include western hemlock, western red cedar and Douglas fir.

Mean temperature ranges from 30/43° (winter) to 50/72° (summer).

303(d) listed waterbodies



Total Maximum Daily Loads

24 TMDLs required from the 1998 303(d) list

303(d) listed Problem Areas

Dissolved oxygen in Allen Creek, French Creek, Quilceda Creek, Snohomish River, and Wood Creek

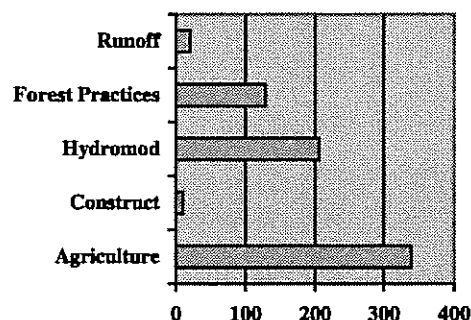
Fecal coliform in Allen Creek, Ebey Slough, French Creek, Pilchuck River, Quilceda Creek, Skykomish River, Snohomish River, and Woods Creek

pH in Ebey Slough, South Fork Snoqualmie River, and Raging River

High temperature in Pilchuck River, Skykomish River, Snohomish River, Wallace River, Snoqualmie River mainstem, South Fork Snoqualmie River, and Tokul Creek

Metals in Port Gardner, Inner Everett Harbor, Possession Sound, Steamboat Slough, and Snohomish River

Stream Miles Impacted by Source



Unified Watershed Assessment Critical Environmental Information

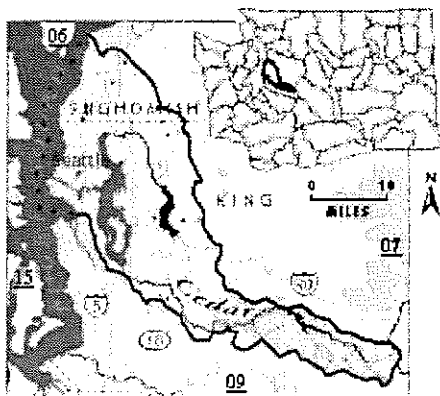
Water	
Flow	Impaired
Quality	Healthy
TMDLs	In process
Public Health	
Shellfish	Healthy
Drinking Water	Threatened
Nitrates	Healthy
Fish	Threatened

Water Quality Programs in WRIA #7

1. Snohomish River Comprehensive Flood Control Management Plan, 1992 - Snohomish County
2. Lake Stevens Watershed Management Plan - Snohomish County
3. Quilceda/Allen Watershed Action Plan - Snohomish County
4. Water Quality Monitoring Program - Snohomish County
5. US Forest Service Northwest Forest Plan
6. Snohomish County Stormwater Management Plan, Snohomish County
7. French Creek Watershed Management Plan, Snohomish County
8. Swamp Creek Watershed Management Plan, Snohomish County
9. North Creek Watershed Management Plan, Snohomish County
10. King County Flood Hazard Reduction Plan

11. King County Stormwater Management Plan
12. Swamp Creek Action Plan

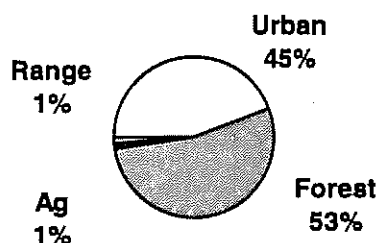
Cedar-Sammamish Basin - WRIA #8



WRIA #8 drains about 442,791 acres of Northern King and Southern Snohomish Counties. The majority of the WRIA is within the Puget Lowland ecoregion.

Demographics

Land Use in the Cedar-Sammamish Basin



Land Base (in acres)

Federal	17,598	3.9%
State	12,984	3.0%
Local	74,703	16.9%
Tribal	-0-	-0-
Private	337,506	76.2%

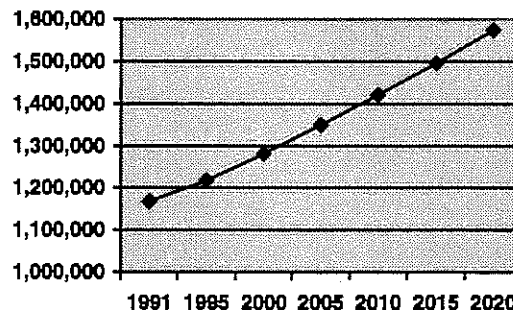
Principal Economic Activity (as total wages)

Services	29%
Retail Trade	17%
Manufacturing	14%
Government	13%
Other	27%

Population

There are approximately 1,216,924 people living in the Cedar-Sammamish River Basin. The primary population centers are Seattle, Bellevue, Renton, and Kirkland. The majority of people live in principal cities.

Projected population trends



Counties

King

Snohomish

Special purpose districts

Conservation Districts: King County; Snohomish County
Snohomish County Watershed Management Area

Principal Cities

Seattle	Bellevue	Renton
Kirkland	Redmond	Edmonds
Lynwood	Mercer Island	Issaquah
Newcastle	Shoreline	Bothell
Mountlake Terrace		Woodinville
Lake Forest Park		

Reservation Lands

none

Environment

Rolling moraines and foothills, floodplains and meandering rivers characterize this basin. Surface material is gravelly sandy loam to deep clay loam, gravelly loam, and cobbly loam. Potential natural vegetation is western hemlock, western red cedar, red alder, and some Douglas fir. Mean

temperature is 31/46° (winter) to 52/78° (summer).

303(d) listed waterbodies



Total Maximum Daily Loads

42 TMDLs required from the 1998 303(d) list

303(d) listed Problem Areas

Fecal coliform in Bear-Evans Creek, Eden Creek, Forbes Creek, Issaquah Creek, Juanita Creek, Lewis Creek, Little Bear Creek, North Creek, Pine Lake Creek, Sammamish River, Swamp Creek, Thornton Creek, Washington Lake, Norma Creek, Yarrow Bay Creek, Fariweather Bay Creek, and others.

High temperature in Issaquah Creek, May Creek, and Sammamish River

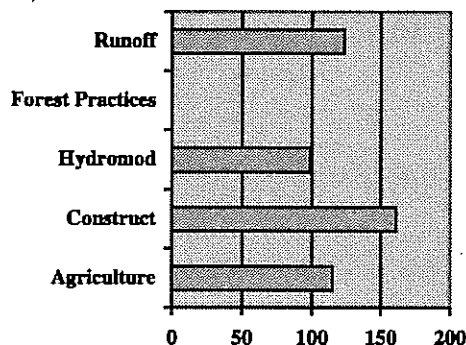
pH in Sammamish River

Pesticides in Kelsey Creek, Lake Union, and Lake Washington

Metals in May Creek and Bear-Evans Creek

Low Dissolved oxygen in Mercer Slough, North Creek, Swamp Creek, and Norma Creek

Stream Miles Impacted by Source



Unified Watershed Assessment Critical Environmental Information

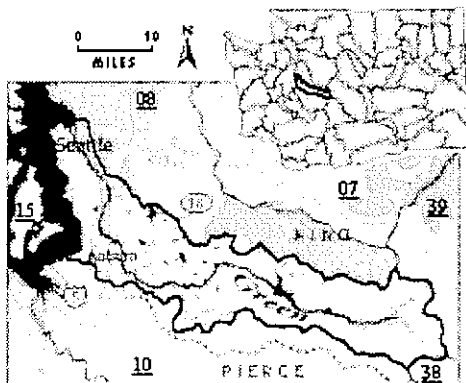
Water	
Flow	Impaired
Quality	Healthy
TMDLs	In process
Public Health	
Shellfish	None
Drinking Water	Threatened
Nitrates	Healthy
Fish	Threatened

Water Quality Programs in WRIA #8

1. City of Lynwood Comprehensive Flood and Drainage Management Plan - City of Lynwood
2. Stormwater Education - City of Lynwood
3. City of Lynwood Stormwater Utility
4. Swamp Creek Watershed Action Plan - Snohomish County
5. North Creek Watershed Action Plan - Snohomish County
6. Water Quality Monitoring in North Creek; Swamp Creek; and Little Bear Creek - Snohomish County
7. Stormwater Management Plan, Seattle Engineering
8. Thornton Creek Watershed Action Plan, Seattle Public Utilities
9. Cedar and Tolt River Water Quality Monitoring, Seattle Water Department

10. Pipers Creek Watershed Action Plan, Seattle Engineering
11. Water Quality Consortium Education, King County Metro

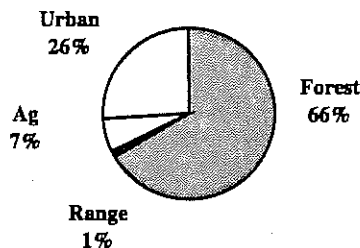
Duwamish-Green Basin - WRIA #9



WRIA #9 drains nearly 372,463 acres, and is entirely located within King County. Upper watershed is mountainous, lower watershed is part of the Puget Lowlands.

Demographics

Land Use in the Duwamish/Green



Land Base (in acres)

Federal	36,228	9.7%
State	21,733	5.8%
Local	17,421	4.6%
Tribal	764	.2%
Private	296,317	79.7%

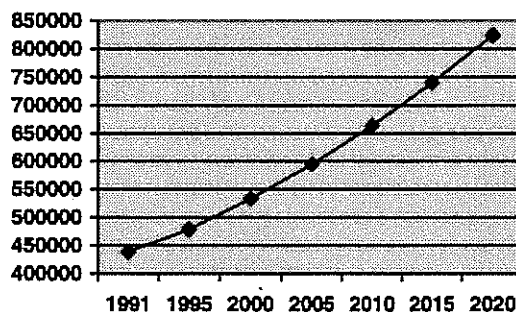
Principal Economic Activity (as total wages)

Services	29%
Retail Trade	17%
Manufacturing	14%
Government	13%
Other	27%

Population

There are approximately 478,508 people living in the Duwamish-Green Basin. The primary population centers are Seattle, Renton, Kent, and Auburn. The majority of people live in unincorporated areas.

Projected population trends



Counties

King (100%)

Special purpose districts:

King Conservation District

Principal Cities

Seattle	Renton
Kent	Auburn
Des Moines	Tukwila
Normandy	Algona
Black Diamond	Federal Way

Reservation Lands

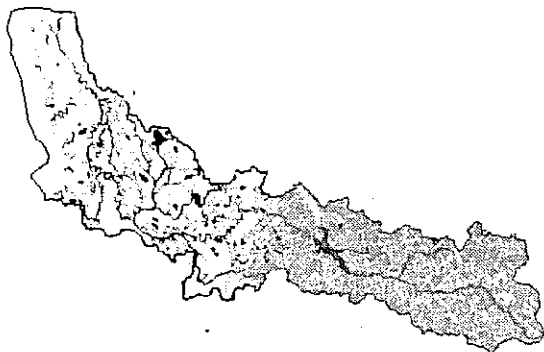
Muckleshoot Tribe

Environment

Lowlands are floodplains and terraces with meandering rivers and oxbow scars. Mountains are U-shaped glaciated valleys with medium gradient rivers. Surface material ranges from deep fertile silt loam to very deep clay loam, gravelly clay loam, and cobbly loam. Potential natural vegetation is western hemlock, western red cedar, Douglas fir, and red alder. Mean

temperature ranges from 33/44° (winter) to 50/78° (summer).

303(d) listed waterbodies



Total Maximum Daily Loads

30 TMDLs required from the 1998 303(d) list

303(d) listed Problem Areas

Fecal coliform in Cold Springs Creek, Crisp Creek, Des Moines Creek, Duwamish River, Green River, Hill Creek, Lakota Creek, Longfellow Creek, Newaukum Creek, Soos Creek, Springbrook Creek, Redondo Creek, Joe's Creek, Hicks Lake, and Lake Meridian

Heavy metals in Duwamish Waterway and River, Elliott Bay, Green River, and Springbrook Creek

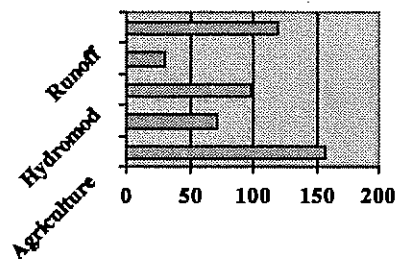
pH in Duwamish Waterway and River

High temperature in Gale Creek, Green River, Hill Creek, Mullen Slough, Smay Creek, Soos Creek, and Springbrook Creek

Dissolved oxygen in Hill Creek, Mullen Slough, Newaukum Creek, Soos Creek, and Springbrook Creek

Organics in Duwamish Waterway and Elliott Bay

Stream Miles Impacted by Source



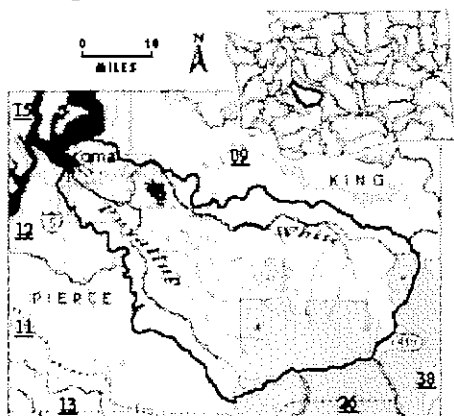
Unified Watershed Assessment Critical Environmental Information

Water	
Flow	Impaired
Quality	Healthy
TMDLs	In process
Public Health	
Shellfish	None
Drinking Water	Threatened
Nitrates	Healthy
Fish	
	Threatened

Water Quality Programs in WRIA #9

1. Longfellow Creek Watershed Action Plan - City of Seattle
2. King County Stream Stewardship
3. Lake Sammamish Restoration Project, King County
4. Mill Creek Water Quality Management Plan, King County
5. Small Farms Animal Waste Disposal, King County Conservation District
6. Remediation of Vector Soils, King County Solid Waste
7. Creative Land Use; Housing, Water, and Forest, King County
8. Lower Mill Creek Improvement Plan, City of Kent
9. Kent Water Quality Management Plan, City of Kent
10. Farmers Nonpoint Pollution Education Project, King County CD
11. Surface Water Action Team, King County Metro
12. Stormwater Treatment, City of Seattle

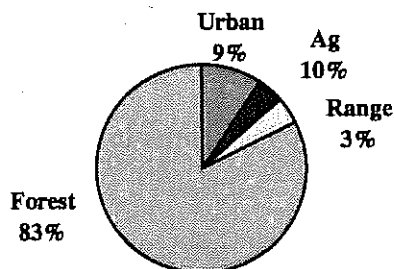
Puyallup-White Basin - WRIA #10



WRIA #10 encompasses about 674,272 acres. This area receives nearly 65 inches of rainfall per year. Upper watershed is in the Cascades ecoregion; lower watershed is in the Puget Lowlands.

Demographics

Land Use in Puyallup Basin



Land Base

Federal	261,460	38.8%
State	4,314	.6%
Local	-0-	-0-
Tribal	21,252	3.2%
Private	387,246	57.4%

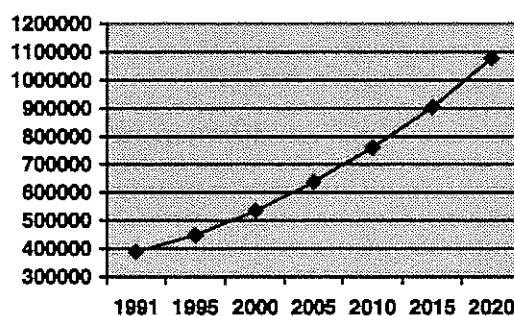
Principal Economic Activity (as total wages)

Agriculture/Forestry	2%
Manufacturing	11%
Retail Trade	20%
Services	27%
Government	21%
Other	19%

Population

There are approximately 449,059 people living in the Puyallup-White Basin. The primary population centers are Tacoma and Puyallup. The majority of people live in unincorporated areas.

Projected population trends



Counties

Pierce (87%)

King (13%)

Special Purpose Districts

Conservation Districts: Pierce County; King

Principal Cities

Tacoma	Puyallup
Bonney Lake	Enumclaw
Sumner	Milton
Pacific	Fife

Reservation Lands

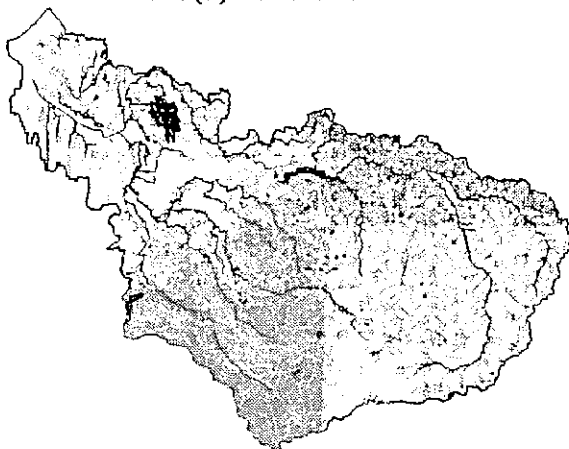
Muckleshoot Tribe
Puyallup Tribe

Environment

Lowlands are floodplains and terraces with meandering rivers and oxbow scars. Mountains are U-shaped glaciated valleys with medium gradient rivers. Surface material ranges from deep fertile silt loam to very deep clay loam, gravelly clay loam, and cobbly loam. Potential natural vegetation is western hemlock, western red cedar, Douglas fir,

and red alder. Mean temperature ranges from 33/44° (winter) to 50/78° (summer).

303(d) listed waterbodies



Total Maximum Daily Loads

20 TMDLs required from the 1998 303(d) list

303(d) listed Problem Areas

High temperature in Boise Creek, Fox Creek, Kings Creek, Scatter Creek, Voight Creek, Wilkenson Creek, and White River

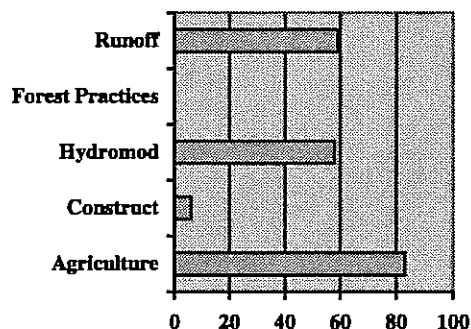
Fecal coliform in Clarks Creek, Clear Creek, Hylebos Creek, Puyallup River, South Prairie Creek, Swan Creek, Wapato Creek, White River, and Commencement Bay

Dissolved oxygen in Fife Ditch, Meeker Ditch, and Wapato Creek

Metals in Commencement Bay, White River, Puyallup River

Low Flows in Puyallup River, Wapato Creek, and White River

Stream Miles Impacted by Source



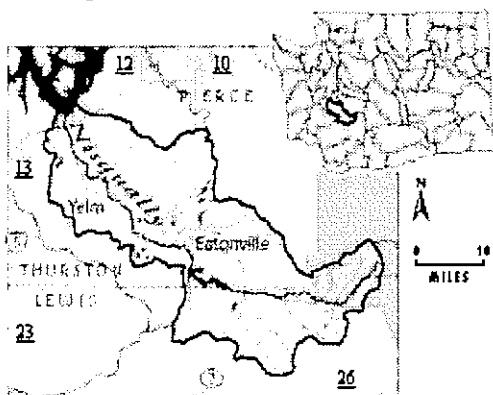
Unified Watershed Assessment Critical Environmental Information

Water	
Flow	Impaired
Quality	Healthy
TMDLs	In process
Public Health	
Shellfish	None
Drinking Water	Threatened
Nitrates	Impaired
Fish	Healthy

Water Quality Programs in WRIA #10

1. US Forest Service Northwest Forest Plan
2. Lower Puyallup Watershed Action Plan - Pierce County
3. Clarks Creek Basin Small Farm Project, Pierce County CD
4. Tacoma Cluster Watershed Action Plan, Pierce County
5. Watershed Education in Pierce County, Pierce County
6. Wellhead Protection Plan and Implementation, City of Tacoma
7. Hylebos Water Quality, Tacoma/Pierce Health
8. Puyallup/Tacoma Ground Water Quality, Pierce County Health
9. Septic System Repair Loan Program, Pierce County Health

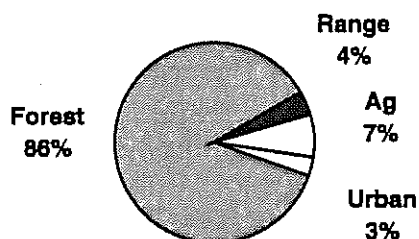
Nisqually Basin - WRIA #11



WRIA #11 encompasses nearly 492,954 acres. The headwaters start at the Nisqually Glacier on Mount Rainier and empties into Puget Sound at the Nisqually Wildlife Refuge.

Demographics

Land Use in the Nisqually Basin



Land Base

Federal	145,523	29.6%
State	60,850	12.3%
Local	-0-	-0-
Tribal	1,575	.3%
Private	85,105	57.8

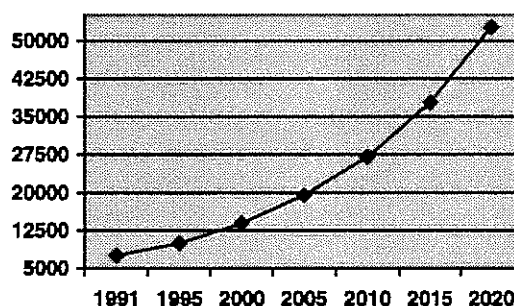
Principal Economic Activity (as total wages)

Agriculture/Forestry	2%
Government	38%
Services	21%
Retail Trade	18%
Other	11%

Population

There are approximately 9,975 people living in the Nisqually Basin. The primary population centers are Eatonville, Yelm, and Roy. The majority of people live in unincorporated areas.

Projected population trends



Counties

Pierce (58%) Lewis (25%)
Thurston (17%)

Special purpose districts:

Conservation Districts: Pierce County; Thurston; Lewis County

Principal Cities

Eatonville Roy
Yelm Dupont
Fort Lewis

Reservation Lands

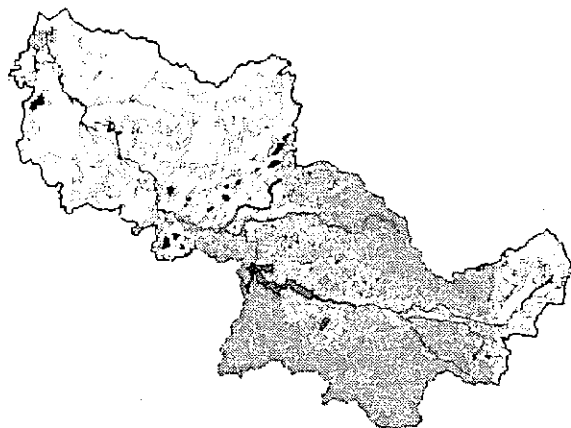
Nisqually Tribe

Environment

Westerly tending U-shaped glaciated valleys. Medium gradient rivers and streams tending to nearly level to rolling glacial outwash and till plains. Surface material is deep well drained gravelly loam, gravelly sandy loam, and clays. Potential natural vegetation is western hemlock, western red cedar, Douglas fir, prairies, and some

oak woodland. Mean temperature ranges from 34/46° (winter) to 47/78° (summer).

303(d) listed waterbodies



Total Maximum Daily Loads

4 TMDLs required from the 1998 303(d) list

303(d) listed Problem Areas

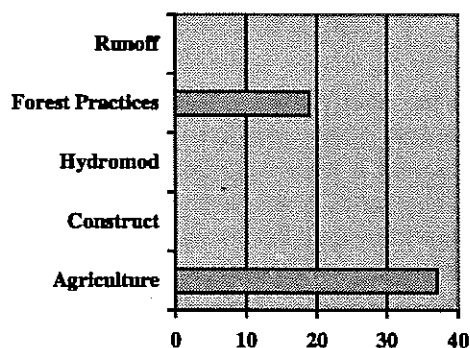
Temperature in Catt Creek

Nutrients in Clear Lake, Harts Lake, and Ohop Lake

Fecal coliform in McAllister Creek, Nisqually River, and Ohop Creek

Dissolved oxygen in McAllister Creek

Stream Miles Impacted by Source



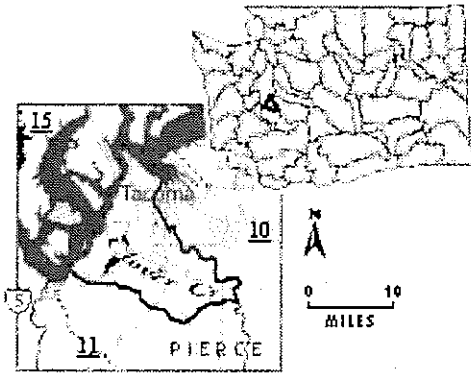
Unified Watershed Assessment Critical Environmental Information

Water	
Flow	Threatened
Quality	Healthy
TMDLs	None
Public Health	
Shellfish	Impaired
Drinking Water	Threatened
Nitrates	Healthy
Fish	Threatened

Water Quality Programs in WRIA #11.

1. Nisqually River Watershed Management Plan
2. Fort Lewis Water Quality Management Program, Fort Lewis
3. Shellfish Closure Response Strategy for Eld Inlet, Thurston County
4. Nisqually River Nonpoint Pollution Reduction, Thurston CD
5. Model Farm Demonstration, Thurston CD
6. Water Quality Education, Thurston County
7. Nisqually Reach Nonpoint Remedial Action, Thurston County
8. Septic System Education and Correction, Thurston County

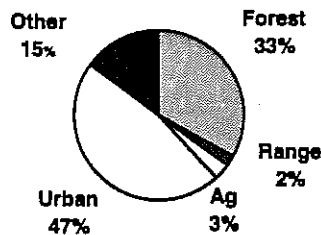
Chambers-Clover Basin - WRIA #12



WRIA #12 drains nearly 109,626 acres. 100% of the watershed is contained within the Puget Lowland ecoregion. Rainfall averages 36 inches per year.

Demographics

Land use in the Chambers/Clover Basin



Land Base (in acres)

Federal	24,912	22.7%
State	488	.5%
Local	1,106	1.0%
Tribal	-0-	-0-
Private	83,120	75.8%

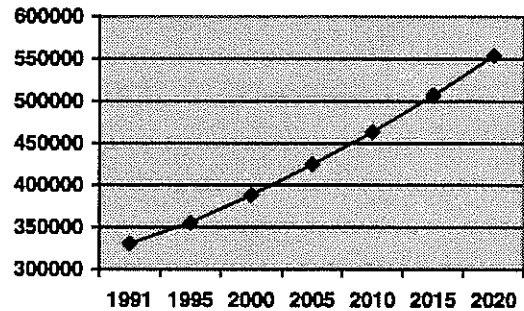
Principal Economic Activity (as total wages)

Agriculture/Forestry	1%
Manufacturing	11%
Retail Trade	20%
Services	27%
Government	22%
Other	19%

Population

There are approximately 355,206 people living in the Chambers-Clover Basin. The primary population centers are Tacoma, Fircrest, and Steilacoom. The majority of people live in unincorporated areas.

Projected population trends



Counties

Pierce (100%)

Special purpose districts

Pierce County Conservation District

Principal Cities

Tacoma	Fircrest
Steilacoom	Ruston
Lakewood	University Place

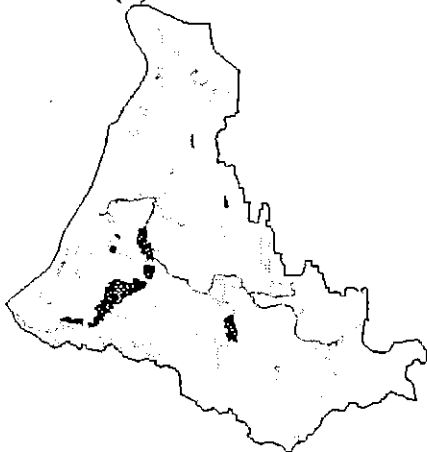
Reservation Lands

None

Environment

This basin has nearly level to rolling glacial outwash and till plains with low gradient streams. Surface material is deep well drained gravelly loam, gravelly sandy loam, and sandy loam. Potential natural vegetation is western hemlock, western red cedar, Douglas fir, and bigleaf maple. Mean temperature ranges from 33/45° (winter) to 52/77° (summer).

303(d) listed waterbodies



Total Maximum Daily Loads

9 TMDLs required from the 1998 303(d) list

303(d) listed Problem Areas

High temperature in Chambers Creek, Clover Creek, and Spanaway Creek

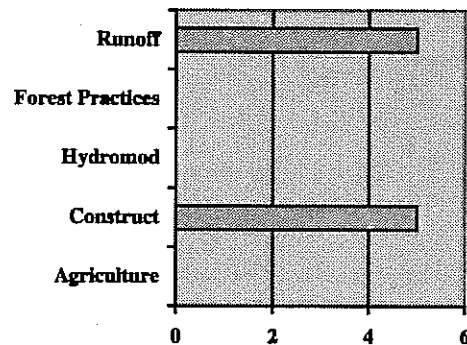
Fecal coliform in Chambers Creek, Clover Creek, and Snake Lake

Dissolved oxygen in Clover Creek and Snake Lake

Nutrients in American Lake, Snake Lake, and Steilacoom Lake

Metals in Chambers Creek

Stream Miles Impacted by Source



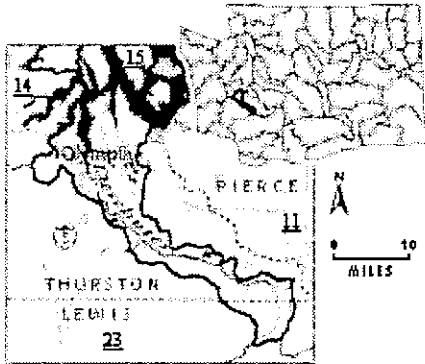
Unified Watershed Assessment Critical Environmental Information

Water	
Flow	Impaired
Quality	Threatened
TMDLs	In process
Public Health	
Shellfish	Healthy
Drinking Water	Healthy
Nitrates	Healthy
Fish	Impaired

Water Quality Programs in WRIA #12

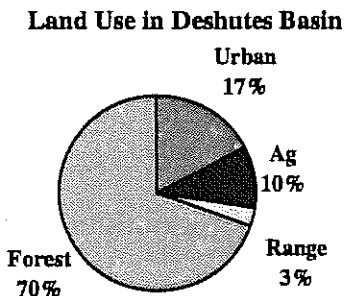
1. American Lake Watershed Management Plan, Pierce County
2. Chambers/Clover Creek Water Quality Study, Pierce County
3. Watershed Education in Pierce County, Pierce County
4. Stormwater Planning, City of Tacoma
5. Wellhead Protection Implementation Strategies, Tacoma Public Utilities
6. Chambers/Clover Creek Implementation, Tacoma/Pierce Health
7. Lake Steilacoom Restoration, Tacoma/Pierce Health

Deschutes Basin - WRIA #13



Located in southern end of Puget Sound, 90% of this basin is in Thurston County, and 10% in Lewis County. The basin encompasses about 189,721 acres and is part of the Puget Lowland Ecoregion.

Demographics



Land Base (in acres)

Federal	5,592	3.0%
State	6,709	3.5%
Local	244	.1%
Tribal	-0-	-0-
Private	117,176	93.4%

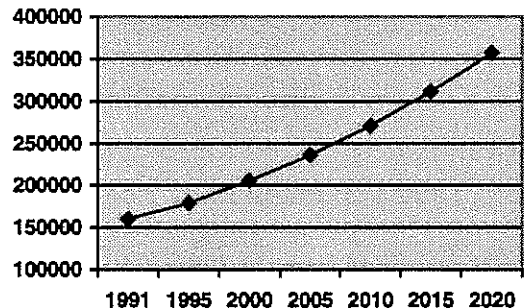
Principal Economic Activity

Government	- 40%
Services	- 21%
Retail Trade	- 18%
Other	- 11%

Population

There are approximately 179,184 people living in the Deschutes River Basin. The primary population centers are Olympia, Lacey, and Rainier. The majority of people live in unincorporated areas.

Projected population trends



Counties

Thurston (90%)
Lewis (10%)

Special purpose districts

Port of Olympia

Conservation Districts: Thurston; Lewis County

Principal Cities

Olympia Lacey
Tumwater Rainier

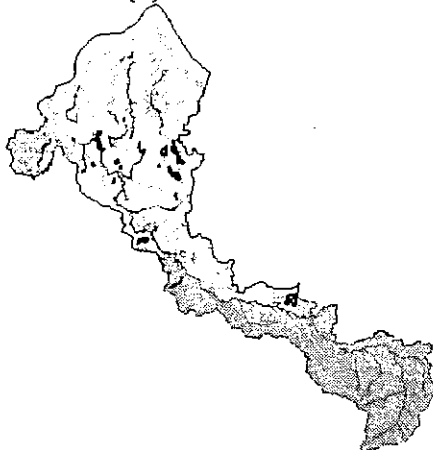
Reservation Lands

None

Environment

This basin has nearly level to rolling glacial outwash and till plains with low gradient streams. Surface material is deep well drained gravelly loam, gravelly sandy loam, and sandy loam. Potential natural vegetation is western hemlock, western red cedar, Douglas fir, and big leaf maple. Mean temperature ranges from 33/45° (winter) to 52/77° (summer).

303(d) listed waterbodies



Total Maximum Daily Loads

28 TMDLs required from the 1998 303(d) list

303(d) listed Problem Areas

Fecal coliform in Ayer Creek, Capitol Lake, Deschutes River, Dobbs Creek, Henderson Inlet, Indian Creek, Mission Creek, Moxlie Creek, Nisqually Reach, Riechel Creek, Woodard Creek, and Woodland Creek

Dissolved oxygen in Budd Inlet, Sleepy Creek, Woodard Creek, and Woodland Creek

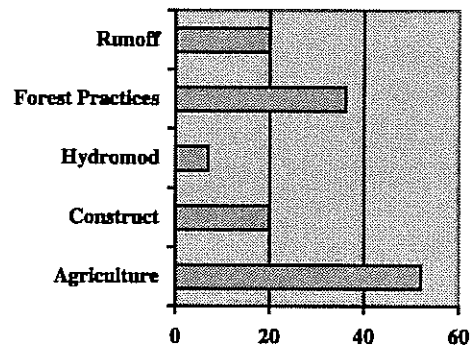
High temperature in Deschutes River and Huckleberry Creek

pH in Ayer Creek, Budd Inlet, Deschutes River, Dobbs Creek, McLane Creek, Sleepy Creek, and Woodard Creek

Low flows in Deschutes River and Woodland Creek

Budd Inlet for metals, hydrocarbons, polyaromatic hydrocarbons, and polychlorinated biphenyls

Stream Miles Impacted by Source



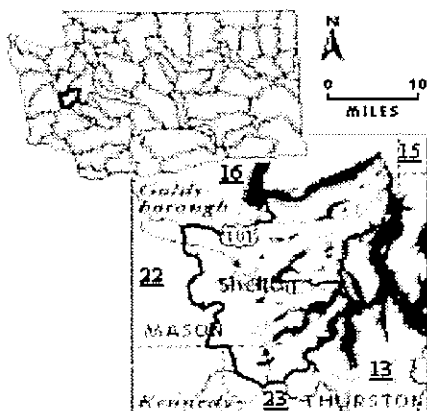
Unified Watershed Assessment Critical Environmental Information

Water	
Flow	Threatened
Quality	Threatened
TMDLs	None
Public Health	
Shellfish	Impaired
Drinking Water	Healthy
Nitrates	Healthy
Fish	Healthy

Water Quality Programs in WRIA #13

1. Deschutes Rivers Watershed Action Plan
2. Capitol Lake Phase II Restoration
3. Chambers, Ward, and Hewitt
4. Comprehensive Drainage Basin Plan
5. City of Lacey Wetland Protection Plan
6. City of Tumwater Wellhead Protection
7. Plan
8. Henderson Inlet Watershed Action Plan
9. Lake Lawrence Phase I Restoration Plan
10. Long Lake Phase II Restoration
11. North Thurston County Ground Water
12. Management Plan
13. Pattison Lake Phase II Restoration Plan
14. Percival Creek Comprehensive Drainage
15. Basin Plan
16. Deschutes Stream Team onsite sanitary survey
17. Stormwater control program/Stormwater utility

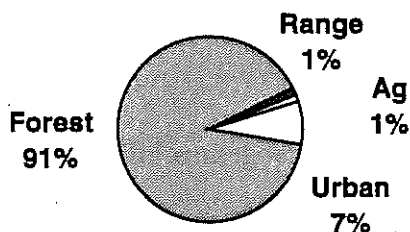
Kennedy-Goldsborough Basin - WRIA #14



Located in southern end of Puget Sound, 85% of this basin lies in Mason County and the remaining 15% is in Thurston County. The basin covers 244,833 acres and is part of the Puget Lowland Ecoregion.

Demographics

Land Use in the Kennedy Basin



Land Base (in acres)

Federal	-0-	-0-
State	13,313	5.4%
Local	-0-	-0-
Tribal	1,086	.4%
Private	230,434	94.2%

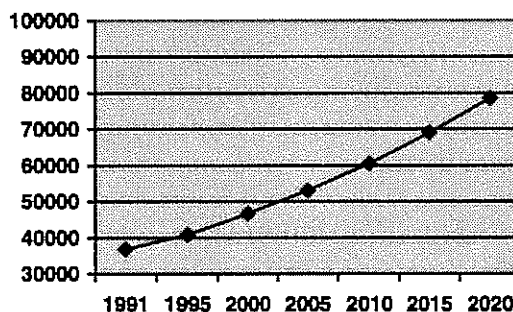
Principal Economic Activity (as total wages)

Agriculture/Forestry	4%
Manufacturing	17%
Retail Trade	17%
Services	18%
Government	29%
Other	15%

Population

There are approximately 40,874 people living in the Kennedy-Goldsborough Basin. The primary population center is Shelton. The majority of people live in unincorporated areas.

Projected population trends



Counties

Mason (85%)
Thurston (15%)

Special purpose districts

Conservation Districts: Mason; Thurston

Principal Cities

Shelton

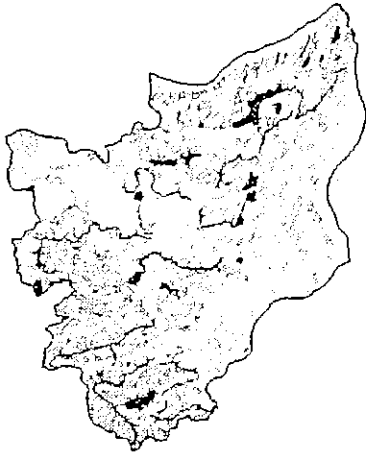
Reservation Lands

Squaxin Island Tribe

Environment

Undulating glacial drift plains with lakes and small, sinuous streams. Coastline is irregularly shaped. It is characterized by many bays and some cliffs. Surface material deep well drained, gravelly sandy loam. Potential natural vegetation is western hemlock, western red cedar, Douglas fir, and some red alder. Mean temperature ranges from 35/44° (winter) to 52/75° (summer).

303(d) listed waterbodies



Total Maximum Daily Loads

11 TMDLs required from the 1998 303(d) list

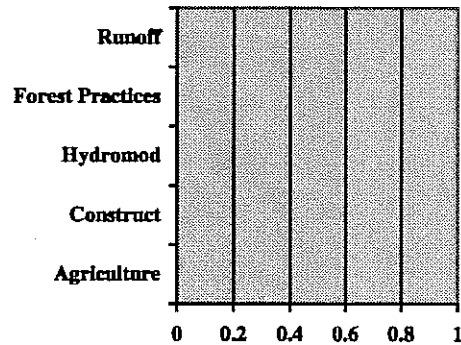
303(d) listed Problem Areas

Fecal coliform in North Bay and Oakland Bay shellfish areas, Burns Creek, Campbell Creek, Case Inlet, Goldsborough Creek, Hammersley Inlet, Happy Hollow Creek, Pierre Creek, Shelton Creek, Skookum Creek, Uncle John Creek

Low Dissolved oxygen for Hood Canal and Case Inlet

Low pH in Squaxin, Peale, and Pickering passages, Burns Creek, Lynch Cove, Kennedy Creek, Perry Creek, Schneider Creek, and Twanoh Falls Creek

Stream Miles Impacted by Source



None identified

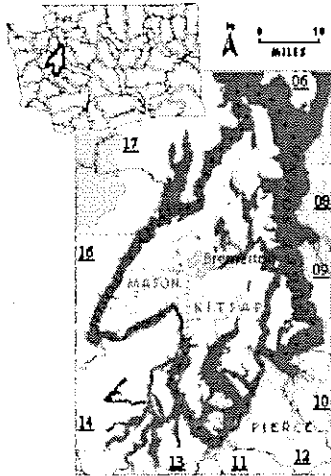
Unified Watershed Assessment Critical Environmental Information

Water	
Flow	Threatened
Quality	Threatened
TMDLs	None yet
Public Health	
Shellfish	Impaired
Drinking Water	Healthy
Nitrates	Healthy
Fish	
	Healthy

Water Quality Programs in WRIA #14

1. Oakland Bay Watershed Management Plan, Mason County
2. Totten/Little Skookum Watershed Action Plan, Mason County
3. Eld Inlet Watershed Action Plan, Thurston County
4. Kennedy Creek Watershed Analysis
5. Lower Hood Canal Watershed Management Plan
6. Lower Hood Canal Sanitary Survey, Mason County

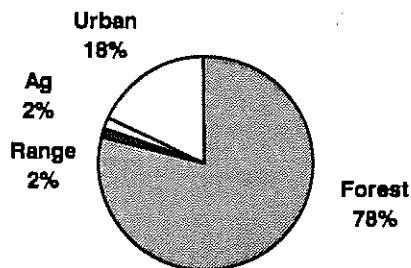
Kitsap Basin - WRIA #15



WRIA #15 encompasses nearly 632,055 acres. This is wholly contained within the Puget Lowland ecoregion and over half is forest land. Rainfall averages 44 inches a year.

Demographics

Land Use in the Kitsap Basin



Land Base (in acres)

Federal	9,127	1.4 %
State	47,663	7.5%
Local	7,714	1.2%
Tribal	4,563	.7%
Private	562,988	89.2%

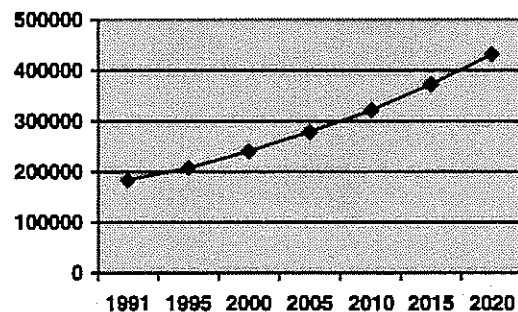
Principal Economic Activity (as total wages)

Retail Trade	21%
Services	24%
Government	35%
Construction	5%
Other	15%

Population

There are approximately 230,334 people living in the Kitsap Basin. The primary population centers are Bremerton, Port Orchard, and Poulsbo. The majority of people live in unincorporated areas.

Projected population trends



Counties

Kitsap (57%)	Pierce (22%)
Mason (13%)	King (8%)

Special Purpose Districts

Conservation Districts: Kitsap; Pierce County; Mason; King
PUD #1 of Kitsap County

Principal Cities

Bremerton	Port Orchard
Poulsbo	Gig Harbor
Winslow	City of Bainbridge

Reservation Lands

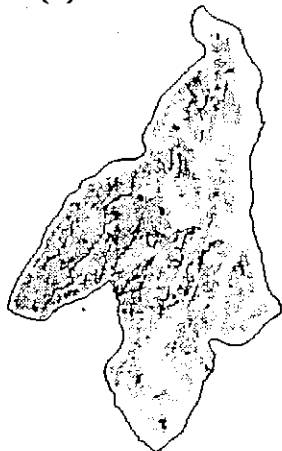
Port Gamble S'Klallam Tribe
Suquamish Tribe

Environment

Undulating glacial drift plains with lakes and small, sinuous streams. Coastline is irregularly shaped. It is characterized by many bays and some cliffs. Surface material is glacial till deposited during the Vashon Glaciation. Underlying materials include stratified clays, sands, and some gravel. Potential natural

vegetation is western hemlock, western red cedar, Douglas fir, and some red alder. Mean temperature ranges from 35/44° (winter) to 52/75° (summer).

303(d) listed waterbodies



Total Maximum Daily Loads

52 TMDLs required from the 1998 303(d) list

303(d) listed Problem Areas

Fecal coliform in Barker Creek, Bear Creek, Beaver Creek, Blackjack Creek, Burley Creek, Clear Creek, Dogfish Creek, Gamble Creek, Gorst Creek, Grovers Creek, Little Minter Creek, Martha-John Creek, Minter Creek, Picnic Creek, Union River, Case Inlet, Dyes Inlet, Lynch Cove, and Sinclair Inlet

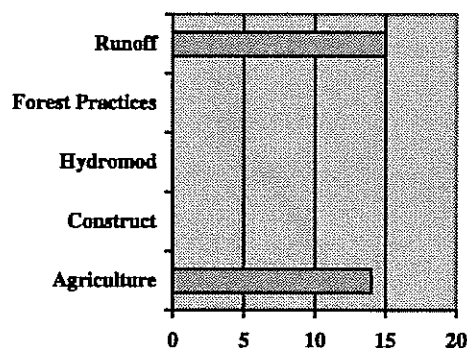
High temperature in Big Beef Creek, Gamble Creek, Mayo Creek, and Miller Lake Creek

pH in Case Inlet, Lynch Cove, Lagoon Creek, Mayo Creek, Little Mission Creek, Picnic Creek, and Private Creek

Metals in Dyes Inlet, Eagle Harbor, and Sinclair Inlet

Polyaromatic hydrocarbons in Dyes Inlet, Eagle Harbor, and Sinclair Inlet

Stream Miles Impacted by Source



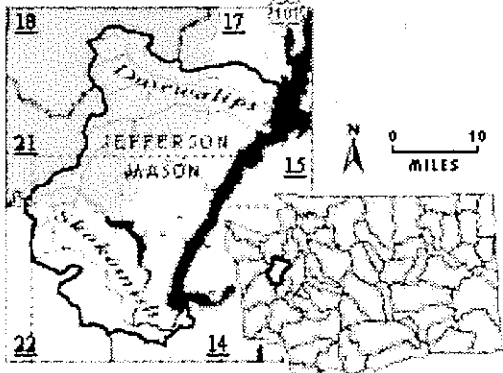
Unified Watershed Assessment Critical Environmental Information

Water	
Flow	Threatened
Quality	Threatened
TMDLs	In process
Public Health	
Shellfish	Impaired
Drinking Water	Threatened
Nitrates	Healthy
Fish	Threatened

Water Quality Programs in WRIA #15

1. Dyes Inlet Watershed Action Plan
2. Sinclair Inlet Watershed Action Plan
3. On-site Systems Sanitary Survey Program
4. County-wide water quality monitoring program
5. Boat Waste Control Program
6. County Stream Team
7. Port Gamble Shellfish Closure Response Strategy
8. Kitsap County Shellfish Protection District
9. Upper Hood Canal Watershed Action Plan
10. Kitsap County Water Quality Monitoring Program
11. Kitsap Health District Sanitary Surveys
12. Kitsap Health District Septic Operation and Maintenance Program
13. Kitsap Health District Public Outreach and Education
14. Kitsap County Stream Team
15. Wellhead Protection Program
16. Boater Waste Control Program

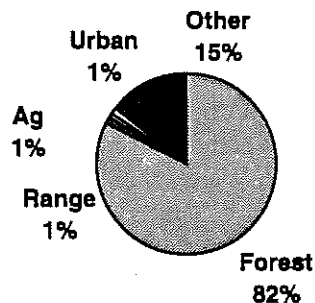
Skokomish/Dosewallips Basin - WRIA #16



WRIA #16 is within Mason and Jefferson Counties. This 406,396 acre watershed encompasses three ecoregions: Coast Range, Cascade and Puget Lowlands.

Demographics

Land Use in the Skokomish/Dosewallips



Land Base (in acres)

Federal	275,783	67.9%
State	32,024	7.9%
Local	-0-	-0-
Tribal	4,982	1.2%
Private	93,607	23.0%

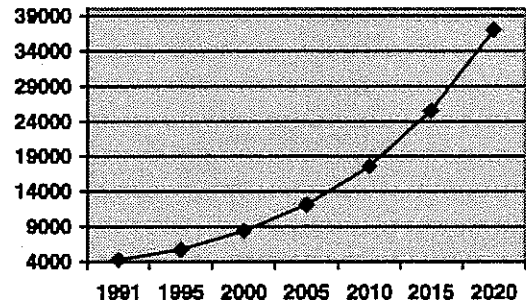
Principal Economic Activity (as total wages)

Government	26%
Retail Trade	23%
Services	22%
Manufacturing	14%
Forestry/Fishing	2%
Other	13%

Population

There are approximately 5,565 people living in the Skokomish-Dosewallips Basin. The primary population centers are Hoodsport and Potlatch. The majority of people live in unincorporated areas.

Projected population trends



Counties

Mason (59%)
Jefferson (41%)

Special purpose districts:

Conservation Districts: Mason; Jefferson County

Principal Cities

Potlatch
Brinnon

Hoodsport

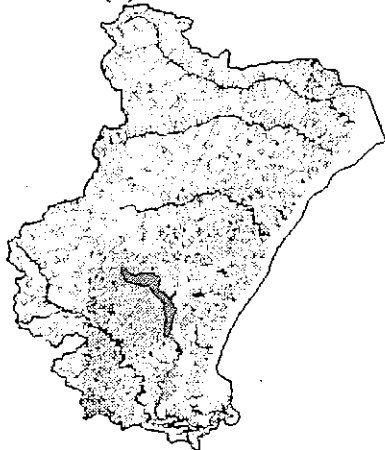
Reservation Lands

Skokomish Tribe

Environment

Glaciated steep higher terrain to low mountains with U-shaped valleys. High gradient streams. Gravelly loam, deep to moderately deep; some silt to silty clay loam. Potential natural vegetation is western hemlock, Douglas fir, red alder, and at higher elevations, Pacific silver fir. Mean temperature ranges from 30/46° (winter) to 50/76° (summer).

303(d) listed waterbodies



Total Maximum Daily Loads

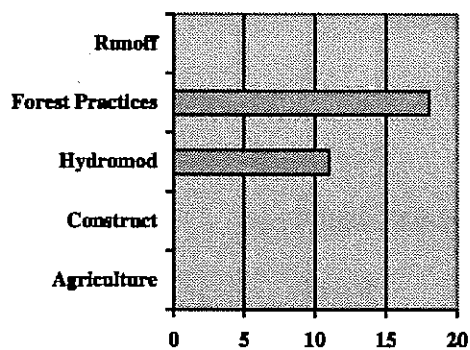
5 TMDLs required from the 1998 303(d) list

303(d) listed Problem Areas

Fecal coliform in Hood Canal, Hunter Creek, Purdy Creek, Skokomish River, Ten Acre Creek, and Weaver Creek

Low instream flows in Skokomish River

Stream Miles Impacted by Source



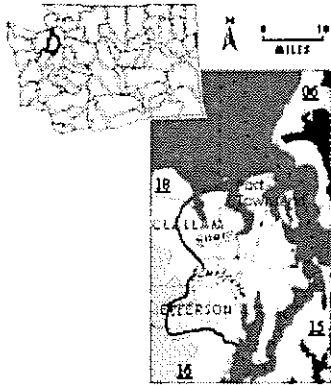
Unified Watershed Assessment Critical Environmental Information

Water	
Flow	Healthy
Quality	Healthy
TMDLs	In process
Public Health	
Shellfish	Impaired
Drinking Water	Healthy
Nitrates	Healthy
Fish	Threatened

Water Quality Programs in WRIA #16

1. Lower Hood Canal Watershed Action Plan, Mason County
2. Skokomish River Comprehensive Flood Hazard Management Plan, Mason County
3. South Fork Skokomish Watershed Analysis
4. US Forest Service Northwest Forest Plan
5. On-site System Technical Assistance, Mason County
6. Water Quality Improvement, Mason County

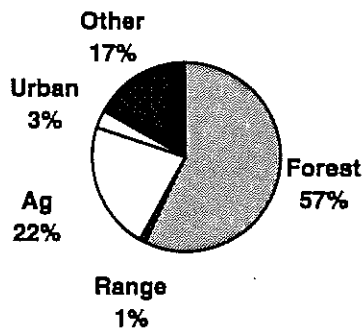
Quilcene/Snow Basin - WRIA #17



WRIA #17 encompasses nearly 401,002 acres. This watershed contains three ecoregions: Puget Lowlands, Coast Range, and the Cascades. Average rainfall is 30 inches per year.

Demographics

Land use in the Quilcene/Snow Basin



Land Base (in acres)

Federal	73,660	18.3%
State	35,469	8.9%
Local	-0-	-0-
Tribal	-0-	-0-
Private	291,873	72.8%

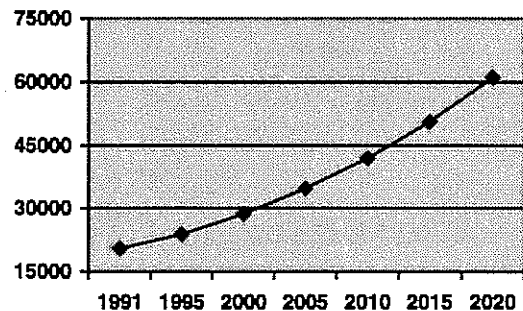
Principal Economic Activity (as total wages)

Government	26%
Retail Trade	23%
Services	22%
Manufacturing	14%
Forestry/Fishing	2%
Other	13%

Population

There are approximately 23,801 people living in the Quilcene-Snow Basin. The primary population center is Port Townsend. The majority of people live in unincorporated areas.

Projected population trends



Counties

Jefferson (86%)
Clallam (14%)

Special purpose districts

Conservation Districts: Jefferson County; Clallam

Irrigation Districts: Highland

Principal Cities

Port Townsend
Quilcene
Port Ludlow

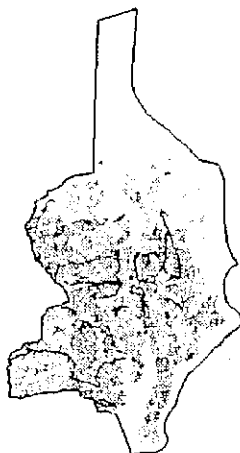
Reservation Lands

Jamestown S'Klallam Tribe

Environment

Glaciated steep higher terrain to low mountains with U-shaped valleys. High gradient streams. Gravelly loam, deep to moderately deep; some silt to silty clay loam. Potential natural vegetation is western hemlock, Douglas fir, red alder, and at higher elevations, Pacific silver fir. Mean temperature ranges from 30/46° (winter) to 50/76° (summer).

303(d) listed waterbodies



Total Maximum Daily Loads

7 TMDLs required from the 1998 303(d) list

303(d) listed Problem Areas

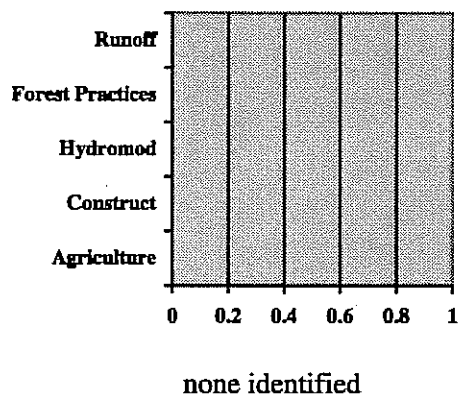
Fecal coliform in Chicken Coop Creek, Chimacum Creek, Dabob Bay, and Jackson Creek

High temperature in Chimacum Creek, Donovan Creek, Leland Creek, Little Quilcene River, Ripley Creek, Tarboo Creek, and Thorndike Creek

Low instream flows in big Quilcene river

Dissolved oxygen and pH in Sequim Bay

Stream Miles Impacted by Source



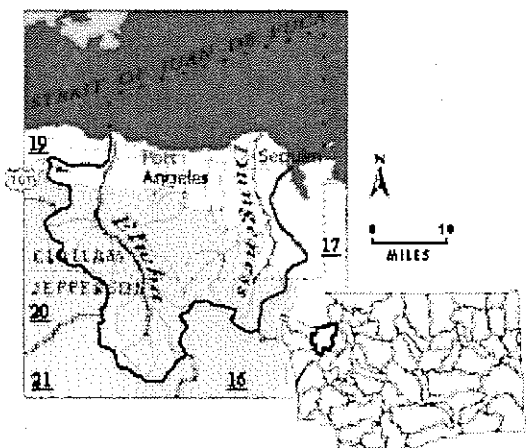
Unified Watershed Assessment Critical Environmental Information

Water	
Flow	Impaired
Quality	Threatened
TMDLs	None yet
Public Health	
Shellfish	Impaired
Drinking Water	Threatened
Nitrates	Healthy
Fish	Threatened

Water Quality Programs in WRIA #17

1. Port Ludlow Watershed Action Plan, Jefferson County
2. Sequim Bay Watershed Action Plan, Clallam County
3. Dungeness/Quilcene Water Resources Management Plan, Clallam County
4. Discovery Bay Watershed Action Plan, Jefferson County
5. Quilcene/Dabob Bay Watershed Action Plan, 1991 Jefferson County
6. A Restoration Feasibility Study for the Big Quilcene River, 1995
7. US Forest Service Northwest Forest Plan

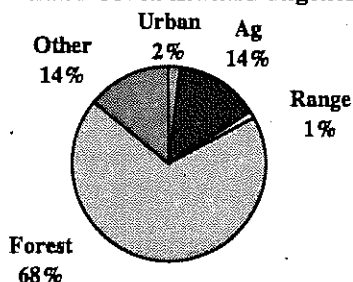
Elwha/Dungeness Basin - WRIA #18



WRIA #18 encompasses 650,549 acres. The Straits of Juan de Fuca border the northern side of this watershed. The average annual rainfall is 52 inches per year.

Demographics

Land Use in Elwha/Dungeness



Land Base (in acres)

Federal	330,844	50.9%
State	27,655	4.2%
Local	104	<.1%
Tribal	400	.1%
Private	291,546	44.8%

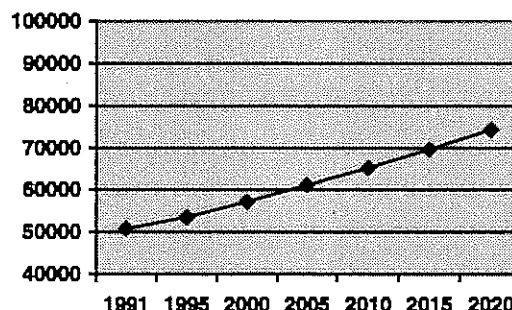
Principal Economic Activity (in total wages)

Government	26%
Retail Trade	23%
Services	22%
Manufacturing	14%
Forestry/Fishing	2%
Other	13%

Population

There are approximately 179,184 people living in the Elwha/Dungeness Basin. The primary population centers are Port Angeles and Sequim. The majority of people live in unincorporated areas.

Projected population trends



Counties

Clallam (82%) Jefferson (18%)

Special purpose districts:

Conservation Districts: Clallam; Jefferson County

Irrigation Districts: Agnew; Cline; Dungeness; Highland

Principal Cities

Port Angeles
Sequim

Reservation Lands

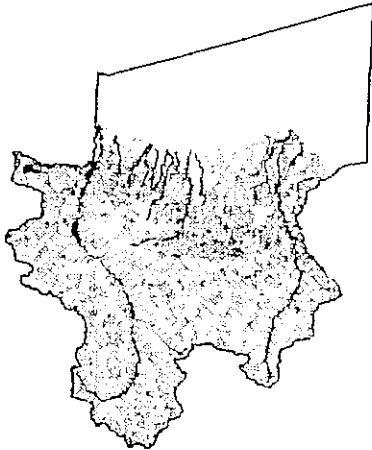
Elwha Klallam Tribe

Environment

Rolling glacial till plains with small, low to medium gradient streams. Soils are typically moderately deep, gravelly sandy loam. Potential natural vegetation is western hemlock, western red cedar, Douglas fir and grassland. Mean

temperature ranges from 36/45° (winter) to 51/64° (summer).

303(d) listed waterbodies



Total Maximum Daily Loads

7 TMDLs required from the 1998 303(d) list

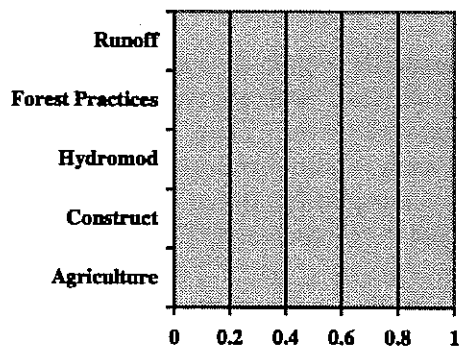
303(d) listed Problem Areas

Fecal coliform in Bagley Creek, Bell Creek, Cassalery Creek, and Matriotti Creek

High temperature in Dry Creek and Elwha River

Low instream flows in Dungeness River

Stream Miles Impacted by Source



None identified

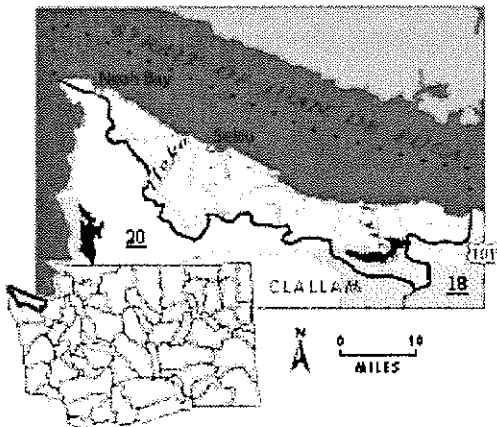
Unified Watershed Assessment Critical Environmental Information

Water	
Flow	Impaired
Quality	Healthy
TMDLs	In process
Public Health	
Shellfish	Threatened
Drinking Water	Healthy
Nitrates	Healthy
Fish	Threatened

Water Quality Programs in WRIA #18

1. Dungeness/Quilcene Water Resource Management Plan, Clallam County
2. Dungeness River Watershed Action Plan, 1995 Clallam County
3. Dungeness River Restoration Plan, 1995
4. US Forest Service Northwest Forest Plan
5. Clallam County Septic Sense, Clallam County
6. Clallam County Water Quality Cleanup Fund, Clallam County
7. Sequim/Dungeness Aquifer Protection Plan, Clallam County
8. Stormwater Pollution Prevention, Clallam County
9. Clallam Water Quality Implementation, Clallam County CD

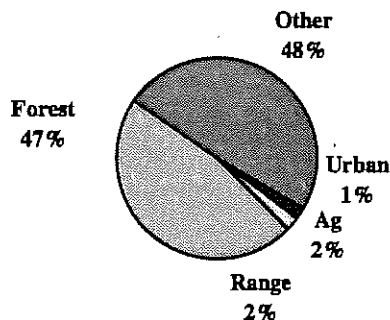
Lyre-Hoko Basin - WRIA #19



WRIA #19 encompasses 494,359 acres. This watershed is totally contained within the Coastal Range ecoregion. Average annual rainfall is 74 inches per year.

Demographics

Land Use in Lyre/Hoko Basin



Land Base (in acres)

Federal	47,022	9.4%
State	55,283	11.2%
Local	-0-	-0-
Tribal	9,639	2.0%
Private	382,415	77.4%

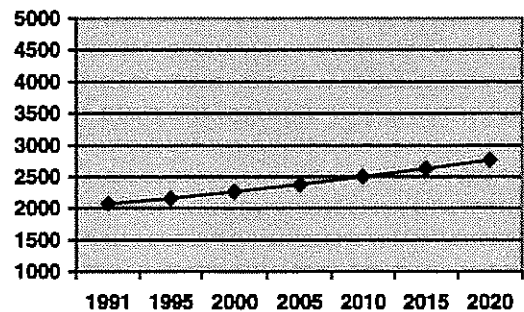
Principal Economic Activity (as total wages)

Manufacturing	11%
Retail Trade	24%
Services	23%
Government	25%
Forestry/Agriculture	2%
Other	15%

Population

There are approximately 2,156 people living in the Lyre-Hoko Basin. The primary population centers are Neah Bay and Clallam Bay. The majority of people live in unincorporated areas.

Projected population trends



Counties

Clallam (100%)

Special purpose districts

Clallam Conservation District

Principal Cities

Neah Bay
Pysht

Clallam Bay
Joyce

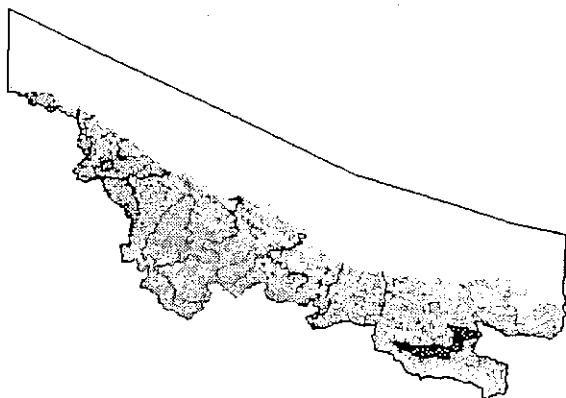
Reservation Lands

Makah Tribe

Environment

Low mountains with U-shaped valleys and high gradient streams. Soils are typically gravelly loam and very gravelly loam. Potential natural vegetation is western hemlock, western red cedar, and some Douglas fir. Mean temperature ranges from 30/45° (winter) to 48/72° (summer).

303(d) listed waterbodies



Total Maximum Daily Loads

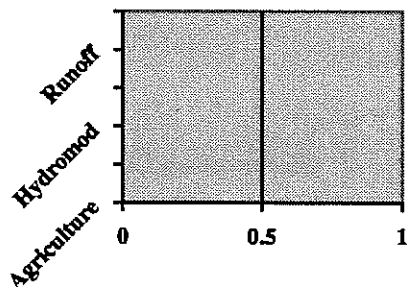
7 TMDLs required from the 1998 303(d) list

303(d) listed Problem Areas

High temperature in Clallam River, Deep Creek, Green Creek, Little Hoko River, and Sekiu River

Fine sediment in Deep Creek

Stream Miles Impacted by Source



None identified

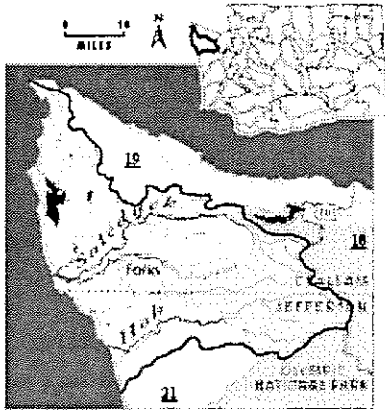
Unified Watershed Assessment Critical Environmental Information

Water	
Flow	Healthy
Quality	Threatened
TMDLs	None yet
Public Health	
Shellfish	Healthy
Drinking Water	Healthy
Nitrates	Healthy
Fish	Threatened

Water Quality Programs in WRIA #19

1. An assessment of physical and biological conditions within the Deep Creek Watershed, North Olympic Washington, 1995 Lower Elwha Klallam Tribe et al
2. Forestland Water Quality Improvement, Clallam CD

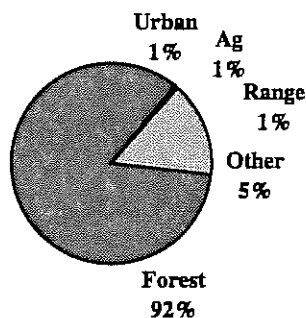
Soleduc Basin - WRIA #20



WRIA #20 encompasses 770,178 acres. The Coastal Range and the Cascades ecoregions make up this watershed. Average annual rainfall is 111 inches per year.

Demographics

Land Use in the Soleduc Basin



Land Base (in acres)

Federal	356,935	46.3%
State	133,646	17.3%
Local	-0-	-0-
Tribal	19,953	2.7%
Private	259,644	33.7%

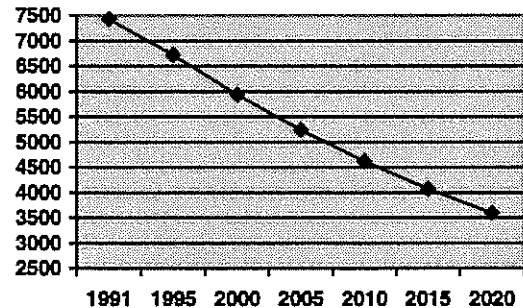
Principal Economic Activity (as total wages)

Manufacturing	11%
Retail Trade	24%
Services	23%
Government	25%
Forestry/Agriculture	2%
Other	15%

Population

There are approximately 6,719 people living in the Soleduc Basin. The primary population center is Forks. The majority of people live in unincorporated areas. The population trend is projected to decline.

Projected population trends



Counties

Clallam (65%)
Jefferson (35%)

Special purpose districts

Conservation Districts: Clallam; Jefferson County

Principal Cities

Forks
La Push

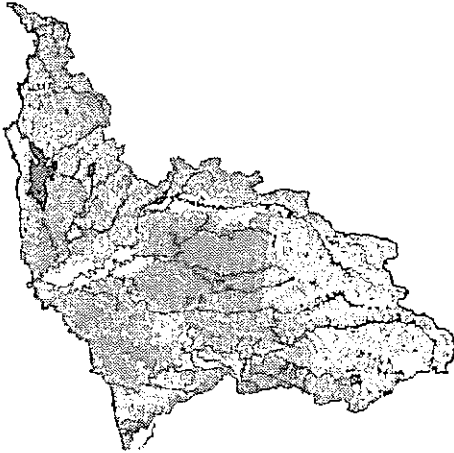
Reservation Lands

Hoh Tribe
Makah Tribe
Quileute Tribe

Environment

Coastal headlands and upland terraces with medium to high gradient streams. Typical soils are mostly deep, silt loam. Potential natural vegetation are sitka spruce, western hemlock, and western red cedar. Mean temperature ranges from 36/48° (winter) to 52/68° (summer).

303(d) listed waterbodies



Total Maximum Daily Loads

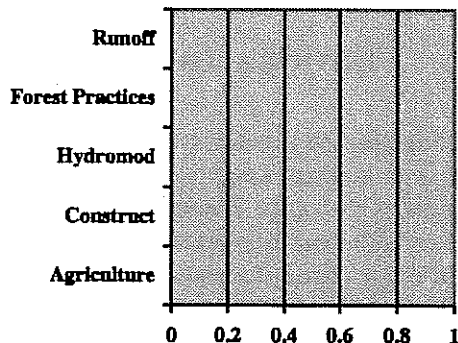
27 TMDLs required from the 1998 303(d) list

303(d) listed Problem Areas

High temperature in Alder Creek, Anderson Creek, Beaver Creek, Bogachiel River, Canyon Creek, Coal Creek, Crooked Creek, Dickey River, Elk Creek, Fisher Creek, Lake Creek, Line Creek, Maple Creek, Maxfield Creek, Nolan Creek, Owl Creek, Rock Creek, Soleduck River, Split Creek, Tower Creek, Willoughby Creek, and Winfield Creek

Dissolved oxygen in Bogachiel River, Lake Creek, and Soleduck River

Stream Miles Impacted by Source



None identified

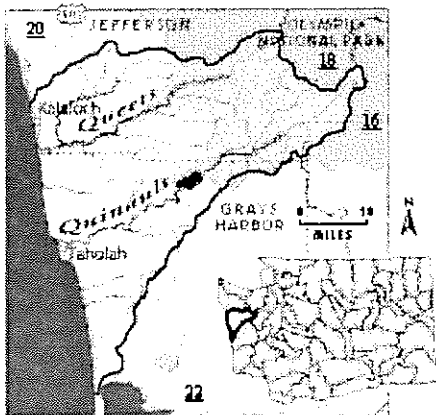
Unified Watershed Assessment Critical Environmental Information

Water	
Flow	Healthy
Quality	Threatened
TMDLs	Required
Public Health	
Shellfish	Healthy
Drinking Water	Healthy
Nitrates	Healthy
Fish	Threatened

Water Quality Programs in WRIA #20

1. Dickey River Watershed Analysis, DNR
2. US Forest Service Northwest Forest Plan

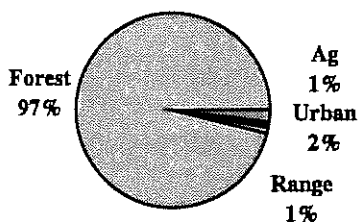
Queets-Quinault Basin - WRIA #21



WRIA #21 encompasses nearly 749,709 acres. Located in the Pacific NW portion of the state, this watershed receives 134 inches of rainfall per year. The Coastal Range and Cascades make up the ecoregion for this watershed.

Demographics

Land Use in the Queets Basin



Land Base (in acres)

Federal	322,128	42.9%
State	112,504	15.1%
Local	-0-	-0-
Tribal	203,912	27.2%
Private	111,165	14.8%

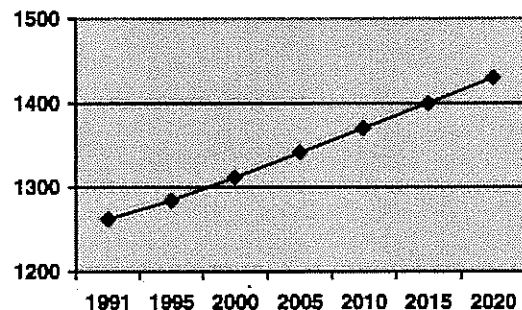
Principal Economic Activity (as total wages)

Manufacturing	11%
Retail Trade	24%
Services	23%
Government	25%
Forestry/Agriculture	2%
Other	15%

Population

There are approximately 1284 people living in the Queets-Quinault Basin. The primary population centers are Ocean City and Moclips. The majority of people live in unincorporated areas.

Projected population trends



Counties

Jefferson (56%) Grays Harbor (43%)
Mason (<1%)

Special purpose districts

Conservation Districts: Jefferson County; Grays Harbor; Mason

Principal Cities

Ocean City Moclips
Taholah Kalaloch

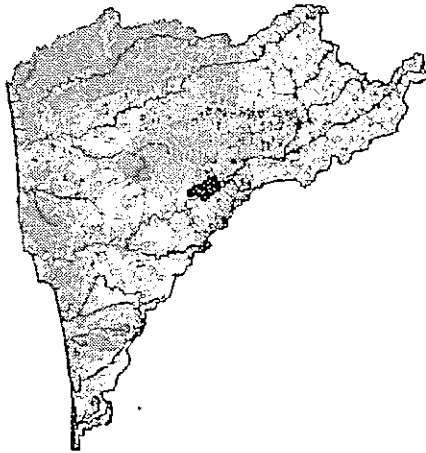
Reservation Lands

Quinault Tribe

Environment

Coastal headlands and upland terraces with medium to high gradient streams. Typical soils are mostly deep, silt loam. Potential natural vegetation are sitka spruce, western hemlock, and western red cedar. Mean temperature ranges from 36/48° (winter) to 52/68° (summer).

303(d) listed waterbodies



Total Maximum Daily Loads

3 TMDLs required from the 1998 303(d) list

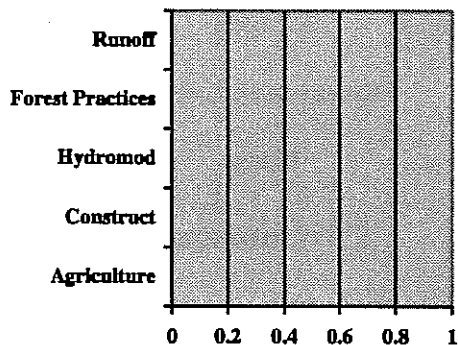
303(d) listed Problem Areas

Fecal coliform in Joe Creek

Low Dissolved oxygen in Joe Creek

High temperature in Kalaloch Creek

Stream Miles Impacted by Source



None identified

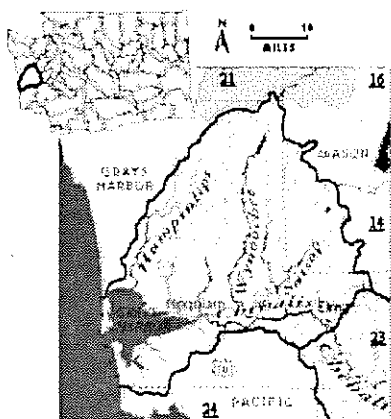
Unified Watershed Assessment Critical Environmental Information

Water	
Flow	Healthy
Quality	Healthy
TMDLs	Required
Public Health	
Shellfish	Healthy
Drinking Water	Healthy
Nitrates	Healthy
Fish	Threatened

Water Quality Programs in WRIA #21

1. US Forest Service Northwest Forest Plan

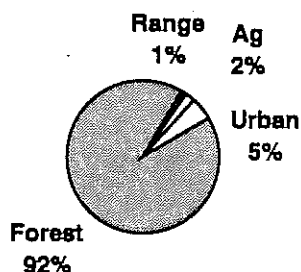
Lower Chehalis Basin - WRIA #22



WRIA #22 encompasses about 907,637 acres. Boardering the Pacific Ocean, this watershed is part of the Coast Range and Puget Lowland ecoregions. Average rainfall is 98 inches per year.

Demographics

Land use in the Lower Chehalis



Land Base (in acres)

Federal	127,743	14.1%
State	22,575	2.5%
Local	11,021	1.2%
Tribal	-0-	-0-
Private	746,298	82.2%

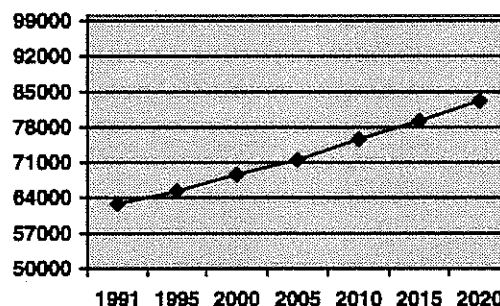
Principal Economic Activity (as total wages)

Agriculture/Forestry	3%
Manufacturing	20%
Retail Trade	21%
Services	21%
Government	21%
Other	14%

Population

There are approximately 65,333 people living in the Lower Chehalis Basin. The primary population centers are Aberdeen, Hoquiam, and Montesano. The majority of people live in unincorporated areas.

Projected population trends



Counties

Grays Harbor (84%)	Mason (15%)
Jefferson (<1%)	Thurston (<1%)
Pacific (<1%)	

Special purpose districts

Conservation Districts: Grays Harbor; Mason

Principal Cities

Aberdeen	Hoquiam
Montesano	Elma
Ocean Shores	Westport

Reservation Lands

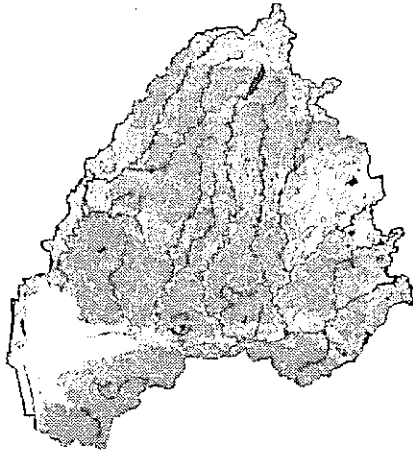
None

Environment

This basin contains a marine estuary, terraces, sand dunes, and spits, and is characterized by low, rolling hills and undulating glacial drift plains. Soils are typically deep silt loam to gravelly sandy loam. Potential natural vegetation is western hemlock, western red cedar, and Douglas fir.

Mean temperature ranges from 31/46° (winter) to 50/76° (summer).

303(d) listed waterbodies



Total Maximum Daily Loads

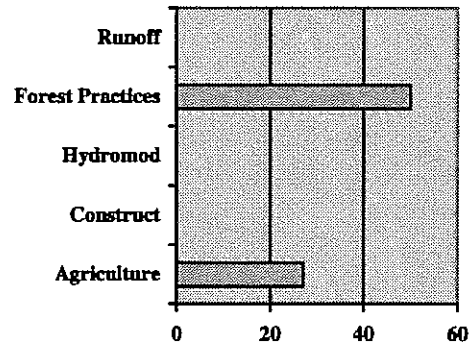
8 TMDLs required from the 1998 303(d) list

303(d) listed Problem Areas

High temperature in Black Creek, Chehalis River, Humptulips River, Rabbit Creek, Wildcat Creek, and Wynoochee River

Fecal coliform in Chehalis River and Grays Harbor

Stream Miles Impacted by Source



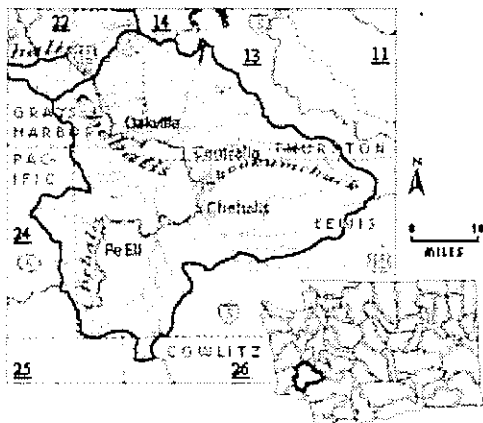
Unified Watershed Assessment Critical Environmental Information

Water	
Flow	Healthy
Quality	Threatened
TMDLs	In process
Public Health	
Shellfish	None
Drinking Water	Threatened
Nitrates	Healthy
Fish	Healthy

Water Quality Programs in WRIA #22

1. US Forest Service Northwest Forest Plan
2. Chehalis River Basin Watershed Action Plan, 1992, Lewis Conservation District
3. West Satsop Watershed Analysis, 1995 Weyerhaeuser/Simpson
4. Chehalis River Basin Fishery Resources: Status, Trends, and Restoration Goals. 1992 USFWS
5. Model Watershed Project, Grays Harbor

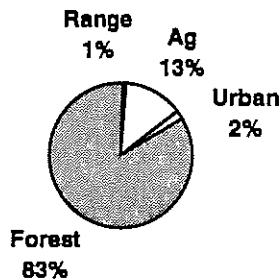
Upper Chehalis Basin - WRIA #23



WRIA #23 encompasses nearly 827,515 acres. Part of the Coastal Range, Puget Lowlands, and Cascades ecoregions, this watershed receives about 57 inches of rainfall per year.

Demographics

Land use in the Upper Chehalis



Land Base (in acres)

Federal	608	.1%
State	159,769	19.3%
Local	24	<.1%
Tribal	4,307	.5%
Private	662,807	80.1%

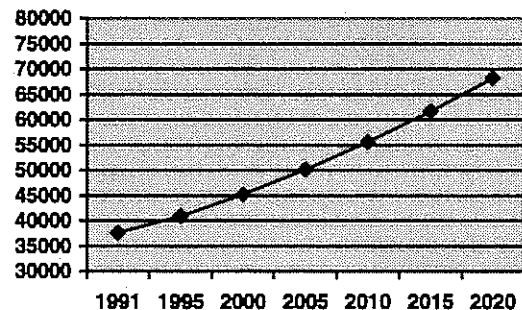
Principal Economic Activity (as total wages)

Agriculture/Forestry	4%
Manufacturing	18%
Retail Trade	23%
Services	18%
Government	19%

Population

There are approximately 40,830 people living in the Upper Chehalis Basin. The primary population centers are Centralia, Chehalis, and Tenino. The majority of people live in unincorporated areas.

Projected population trends



Counties

Lewis (60%) Thurston (24%)
 Grays Harbor (11%) Pacific (4%)
 Cowlitz (1%)

Special purpose districts:

Conservation Districts: Lewis County; Thurston; Grays Harbor; Pacific

Principal Cities

Centralia Chehalis
 Tenino Napavine
 Pe Ell Bucoda

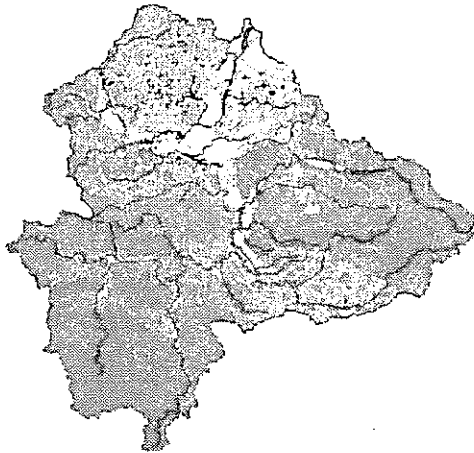
Reservation Lands

Chehalis Confederated Tribes

Environment

Low, rolling hills, terraces, and floodplains in the lower basin, U-shaped glaciated valleys in the east. Typical soils are deep silt loam to gravelly clay loam, sandy loam, and cobbly loam. Mean temperature ranges from 31/41° (winter) to 47/78° (summer).

303(d) listed waterbodies



Total Maximum Daily Loads

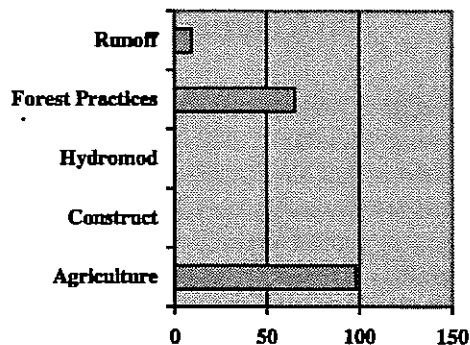
25 TMDLs required from the 1998 303(d) list

303(d) listed Problem Areas

Fecal coliform in Berwick Creek, Chehalis River, Demsey Creek, Dillenbaugh Creek, Elk Creek, Lincoln Creek, Newaukum River, Salzer Creek, Scatter Creek, and Skookumchuck River

High temperature in Black River, Chehalis River, Dillenbaugh Creek, Lincoln Creek, Newaukum River, Salzer Creek, Scatter Creek, and Skookumchuck River

Stream Miles Impacted by Source



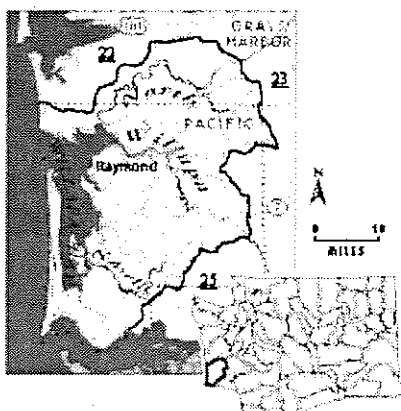
Unified Watershed Assessment Critical Environmental Information

Water	
Flow	Healthy
Quality	Threatened
TMDLs	In process
Public Health	
Shellfish	None
Drinking Water	Threatened
Nitrates	Healthy
Fish	Impaired

Water Quality Programs in WRIA #23

1. Chehalis River Basin Watershed Action Plan, 1992, Lewis Conservation District
2. Chehalis River Basin Fishery Resources: Status, Trends, and Restoration Goals. 1992 USFWS
3. Animal Waste Management, Lewis CD
4. Chehalis Watershed Management Committee, Lewis CD
5. Dillenbaugh Creek Model Watershed, Lewis CD
6. Salzer Creek Watershed Restoration, Lewis CD
7. On-site Sewage Technical Assistance, Lewis County

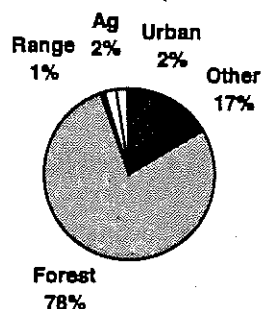
Willapa Basin - WRIA #24



WRIA #24 encompasses nearly 734,106 acres. Except for a small portion of the uplands, this watershed is part of the Coast Range ecoregion. Average annual rainfall is 84 inches per year.

Demographics

Land use in Willapa Basin



Land Base (in acres)

Federal	5,151	.7%
State	71,431	9.7%
Local	41	<.1%
Tribal	341	.1%
Private	657,142	89.5%

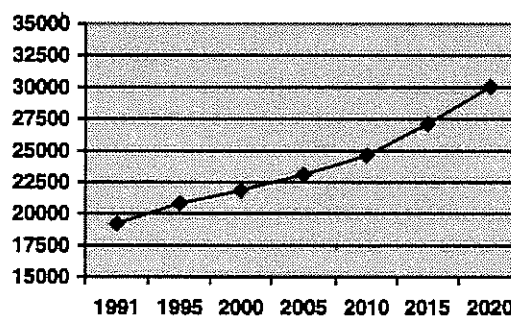
Principal Economic Activity (as total wages)

Forestry/Fishing	7%
Manufacturing	20%
Retail Trade	20%
Services	18%
Government	26%
Other	9%

Population

There are approximately 20,800 people living in the Willapa Basin. The primary population centers are Raymond and South Bend. The majority of people live in unincorporated areas.

Projected population trends



Counties

Pacific (83%)	Grays Harbor (16%)
Lewis (<1%)	Wahkiakum (<1%)

Special purpose districts

Conservation Districts: Pacific; Grays Harbor

Principal Cities

Raymond	South Bend
Long Beach	Ilwaco

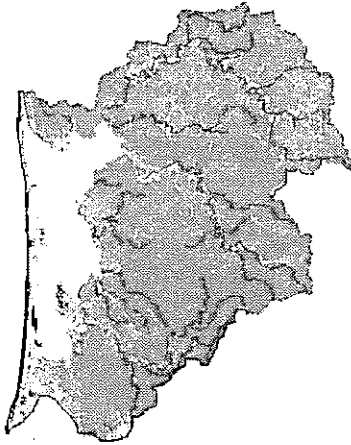
Reservation Lands

Shoalwater Bay Tribe

Environment

Coastal headlands and upland terraces with steeply sloping mountains. Medium to high gradient streams that have stable summer flow. Typical soils are deep silty clay loam to gravelly loam. Potential natural vegetation is sitka spruce, western hemlock, western red cedar, and some Douglas fir. Mean temperature ranges from 30/50° (winter) to 50/76° (summer).

303(d) listed waterbodies



Total Maximum Daily Loads

10 TMDLs required from the 1998 303(d) list

303(d) listed Problem Areas

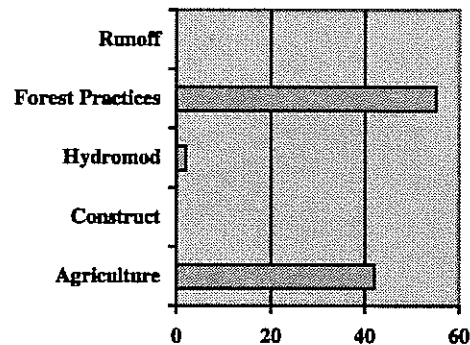
Fecal coliform in the Columbia River, Grayland Ditch, North River, Willapa Bay, and Willapa River

High temperature in Elkhorn Creek, Fork Creek, Joe Creek, Little North River, Naselle River, North River, Upper Salmon Creek, Smith Creek, and Willapa River

Total Dissolved Gas in Columbia River

Dissolved oxygen in Grayland Ditch and Wallapa River

Stream Miles Impacted by Source



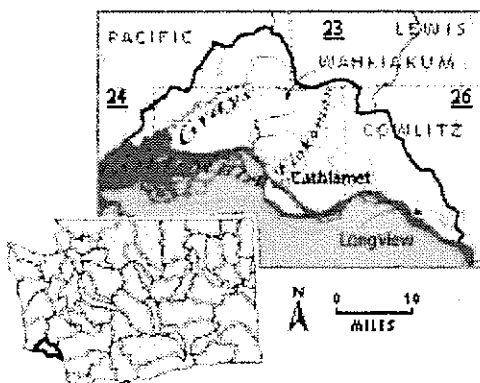
Unified Watershed Assessment Critical Environmental Information

Water	
Flow	Healthy
Quality	Threatened
TMDLs	In process
Public Health	
Shellfish	Impaired
Drinking Water	Threatened
Nitrates	Healthy
Fish	Healthy

Water Quality Programs in WRIA #24

1. Little North River Watershed Analysis, 1995 Weyerhaeuser
2. Willapa River TMDL in progress
3. Willapa Bay Water Resources Coordinating Council information clearinghouse, Pacific County
4. North Pacific County Infrastructure Action Team-economic development and water quality concerns
5. Spartina Control Research, Pacific CD
6. Dairy Farm Plans and Manure Management, Pacific CD

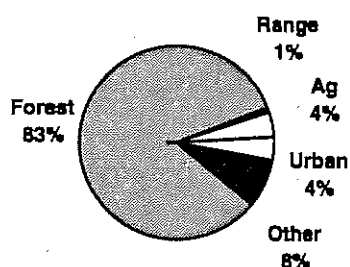
Grays-Elochoman Basin - WRIA #25



WRIA #25 encompasses nearly 322,582 acres. Located along the Lower Columbia River, the majority of this watershed is in the Coast Range ecoregion. Average annual rainfall is 80 inches per year.

Demographics

Land use in Grays/Elochoman



Land Base (in acres)

Federal	2,483	.7%
State	51,958	16.2%
Local	-0-	-0-
Tribal	-0-	-0-
Private	268,141	83.1%

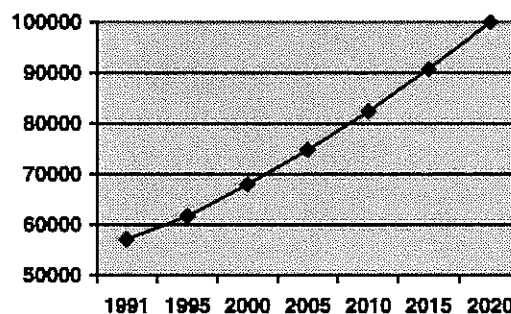
Principal Economic Activity (as total wages)

Agriculture/Forestry	7%
Manufacturing	23%
Retail Trade	16%
Services	14%
Government	32%
Other	8%

Population

There are approximately 61,659 people living in the Grays-Elochoman Basin. The primary population center is Longview. The majority of people live in unincorporated areas.

Projected population trends



Counties

Wahkiakum (56%)	Cowlitz (26%)
Pacific (17%)	Lewis (1%)

Special purpose districts

Conservation Districts: Wahkiakum; Cowlitz; Pacific

Principal Cities

Longview	Cathlamet
Altoona	

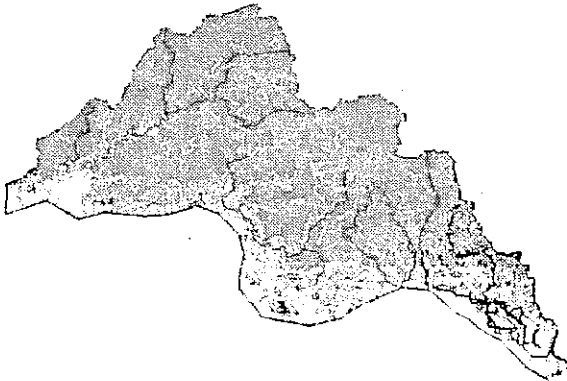
Reservation Lands

None

Environment

This basin contains coastal headlands and upland terraces and is characterized by low, rolling hills and undulating glacial drift plains. Soils are typically deep silt loam to gravelly sandy loam. Potential natural vegetation is western hemlock, western red cedar, and Douglas fir. Mean temperature ranges from 31/46° (winter) to 50/76° (summer).

303(d) listed waterbodies



Total Maximum Daily Loads

6 TMDLs required from the 1998 303(d) list

303(d) listed Problem Areas

Fecal coliform in Columbia River and Longview Ditches

Metals in Columbia River and Longview Ditches

Pesticides in Columbia River and Sacajawea Lake

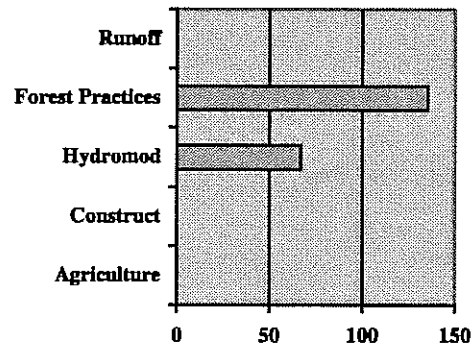
Dissolved oxygen in Columbia River and Longview Ditches

High temperatures in Columbia River, Elochoman River, Germany Creek, and Grays River

Total Dissolved Gas in Columbia River

Turbidity in Longview Ditches

Stream Miles Impacted by Source



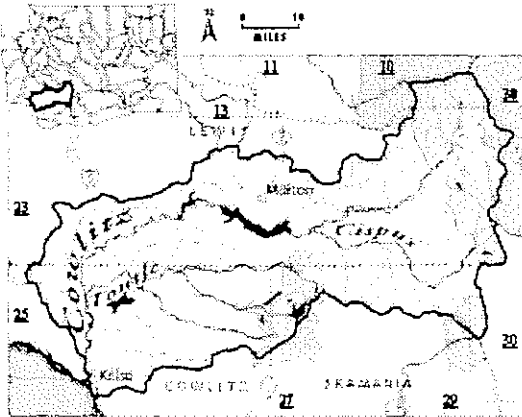
Unified Watershed Assessment Critical Environmental Information

Water	
Flow	Healthy
Quality	Threatened
TMDLs	In process
Public Health	
Shellfish	None
Drinking Water	Healthy
Nitrates	Healthy
Fish	
	Threatened

Water Quality Programs in WRIA #25

1. Grays River Watershed Plan, Wahkiakum CD
2. Ground Water Protection Project, Wahkiakum CD

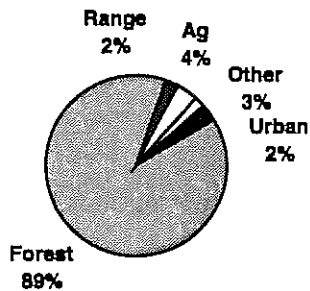
Cowlitz Basin - WRIA #26



WRIA #26 encompasses nearly 1,597,566 acres. The upper watershed is part of the Cascade ecoregion, The lower portion is in the Puget Lowlands. Average annual rainfall is 72 inches per year.

Demographics

Land use in the Cowlitz Basin



Land Base (in acres)

Federal	685,932	42.8%
State	81,489	5.2%
Local	22	<.01%
Tribal	869	.1%
Private	829,254	51.9%

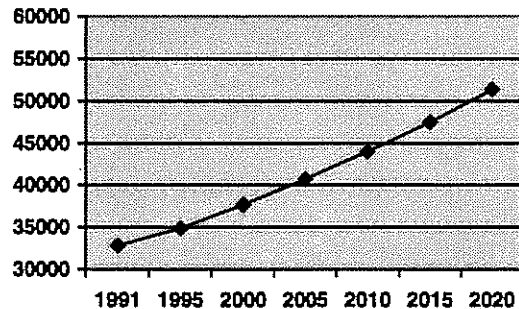
Principal Economic Activity (as total wages)

Manufacturing	27%
Retail Trade	19%
Services	20%
Government	14%
Construction	7%
Other	13%

Population

There are approximately 34,882 people living in the Cowlitz Basin. The primary population centers are Kelso and Castle Rock. The majority of people live in unincorporated areas.

Projected population trends



Counties

Lewis (57%)	Cowlitz (27%)
Skamania (13%)	Pierce (2%)
Yakima (1%)	

Special purpose districts

Conservation Districts: Lewis County; Cowlitz; Underwood

Principal Cities

Kelso	Castle Rock
Morton	Winlock
Toledo	Mossyrock

Reservation Lands

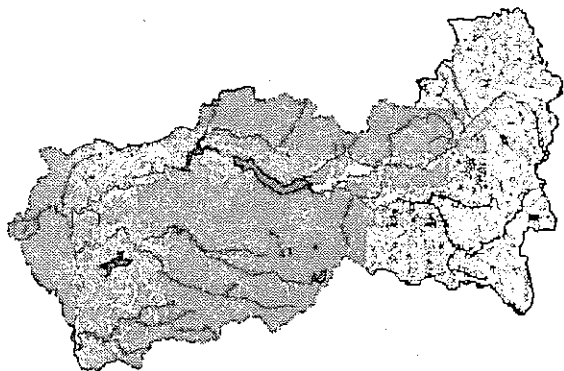
None

Environment

Glaciated valleys, ranging from U-shaped to steep, dissected mountains. Streams are high to medium gradient. Soils are typically deep clay loam, silt loam, gravelly loam, and cobbly loam. Potential natural vegetation is western hemlock, western red cedar, Pacific silver fir, some Douglas fir and some noble fir. Mean

temperature ranges from 26/41° (winter) to 44/78° (summer).

303(d) listed waterbodies



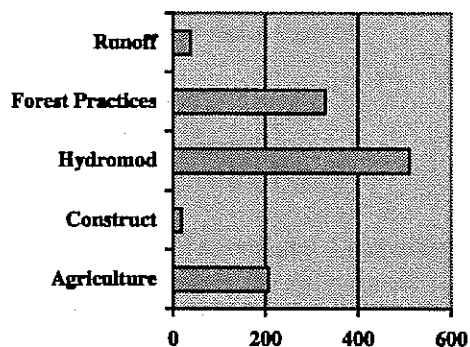
Total Maximum Daily Load

10 TMDLs required from the 1998 303(d) list

303(d) listed Problem Areas

High temperature in Baird Creek, Cispus River, Coweeman River, East Canyon Creek, Goble Creek, Green River, Herrington Creek, Iron Creek, Mulholland Creek, Silver Creek, and Willame Creek

Stream Miles Impacted by Source



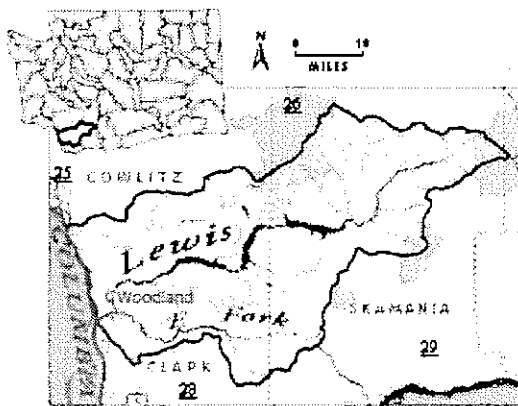
Unified Watershed Assessment Critical Environmental Information

Water	
Flow	Healthy
Quality	Healthy
TMDLs	Required
Public Health	
Shellfish	None
Drinking Water	Threatened
Nitrates	Healthy
Fish	Impaired

Water Quality Programs in WRIA #26

1. US Forest Service Northwest Forest Plan
2. Silver Lake Phase II Restoration
3. Onsite Sewage Technical Assistance, Lewis County

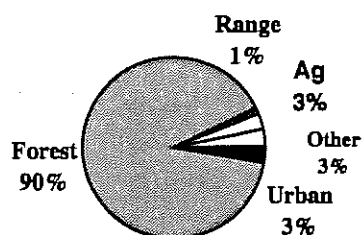
Lewis Basin - WRIA #27



WRIA #27 encompasses nearly 837,431 acres. The Cascades, Puget Lowlands, and Willamete Valley make up the ecoregions for this watershed. Average rainfall is about 90 inches per year.

Demographics

Land use in the Lewis Basin



Land Base (in acres)

Federal	366,474	43.8%
State	89,325	10.6%
Local	686	.1%
Tribal	-0-	-0-
Private	380,946	45.5%

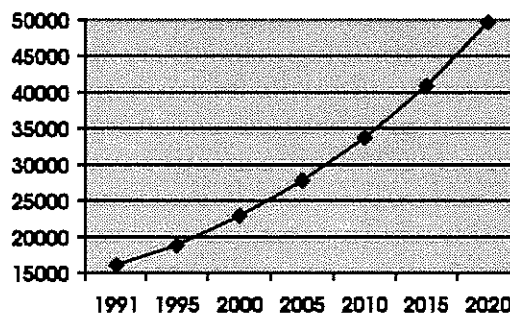
Principal Economic Activity (as total wages)

Manufacturing	20%
Retail Trade	20%
Services	22%
Government	17%
Other	11%

Population

There are approximately 18,831 people living in the Lewis Basin. The primary population centers are Woodland and Ridgefield. The majority of people live in unincorporated areas.

Projected population trends



Counties

Skamania (49%) Cowlitz (26%)
Clark (25%)

Special purpose districts

Conservation Districts: Cowlitz; Clark County; Underwood

Principal Cities

Woodland Ridgefield
Kalama Yacolt

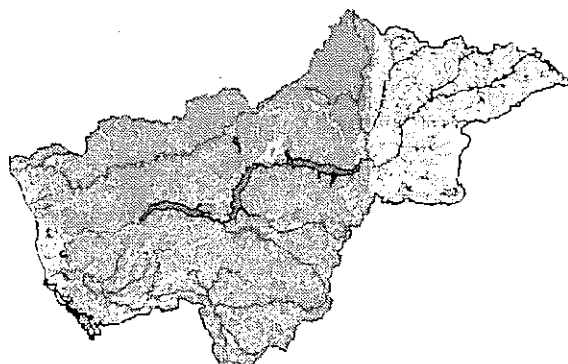
Reservation Lands

None

Environment

Upper basin has U-shaped glaciated valleys, lower basin has floodplains with low gradient meandering streams. Typical soil ranges from deep, silty clay loam to gravelly loam, and cobbly loam. Potential natural vegetation includes prairies, Oregon white oak, western hemlock, western red cedar, and Douglas fir. Mean temperature ranges between 31/45° (winter) to 47/80° (summer).

303(d) listed waterbodies



Total Maximum Daily Loads

11 TMDLs required from the 1998 303(d) list

303(d) listed Problem Areas

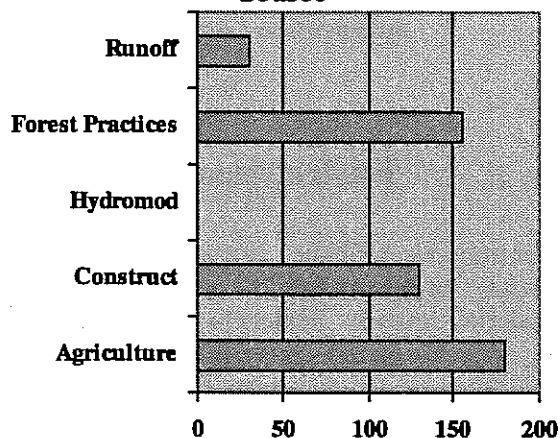
Pesticides and Metals in Columbia River

High temperature in Columbia River, Hatchery Creek, Kalama River, Lewis River, and McCormick Creek

Fecal coliform in Lewis River, Lockwood Creek, McCormick Creek, Rock Creek, and Yacolt Creek

Total Dissolved Gas in Columbia River

Stream Miles Impacted by Source



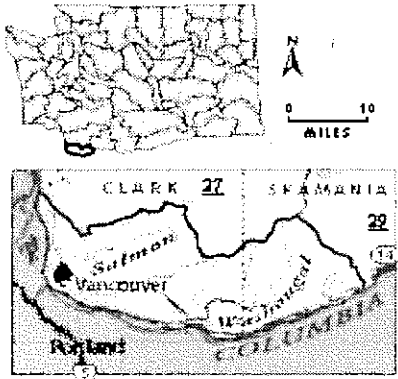
Unified Watershed Assessment Critical Environmental Information

Water	
Flow	Healthy
Quality	Healthy
TMDLs	Required
Public Health	
Shellfish	None
Drinking Water	Healthy
Nitrates	Healthy
Fish	Threatened

Water Quality Programs in WRIA #27

1. US Forest Service Northwest Forest Plan
2. Watershed Action Plan for East Fork Lewis River, Clark County

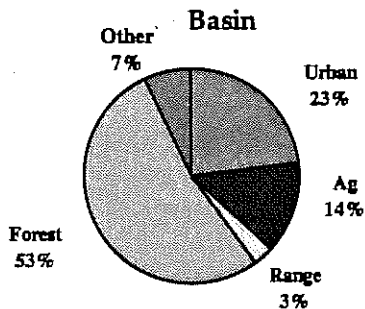
Salmon-Washougal Basin - WRIA #28



WRIA #28 contains nearly 316,365 acres. Located along the lower Columbia River, the Willamette Valley and Cascade make up the ecoregions for this watershed. Rainfall averages 63 inches per year.

Demographics

Land Use in Salmon-Washougal Basin



Land Base (in acres)

Federal	12,594	4.0%
State	57,998	18.3%
Local	1,182	.4%
Tribal	-0-	-0-
Private	244,591	77.3%

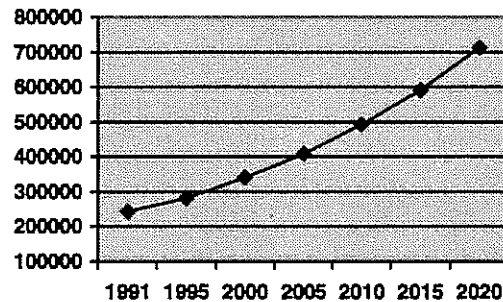
Principal Economic Activity (as total wages)

Manufacturing	20%
Retail Trade	20%
Services	22%
Government	17%
Other	11%

Population

There are approximately 282,278 people living in the Salmon-Washougal Basin. The primary population centers in the basin are Vancouver, Washougal, and Camas. The majority live in unincorporated areas.

Project population trends



Counties

Clark (67%)
Skamania (33%)

Special purpose districts

Conservation Districts: Clark County; Underwood

Principal Cities

Vancouver	Camas
Washougal	Battle Ground
Ridgefield	North Bonneville

Reservation Lands

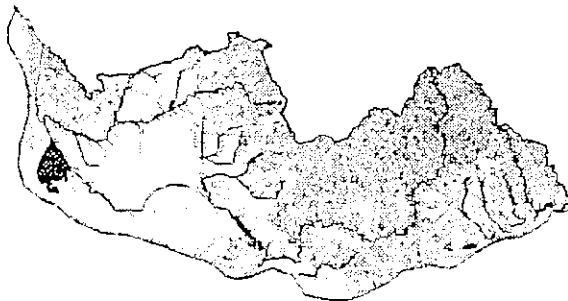
None

Environment

Upper basin has U-shaped glaciated valleys, lower basin has floodplains with low gradient meandering streams. Typical soil ranges from deep, silty clay loam to gravelly loam, and cobbly loam. Potential natural vegetation includes prairies, Oregon white oak, western hemlock,

western red cedar, and Douglas fir. Mean temperature ranges between 31/45° (winter) to 47/80° (summer).

303(d) listed waterbodies



Total Maximum Daily Loads

27 TMDLs required from the 1998 303(d) list

303(d) listed Problem Areas

Dissolved oxygen in Burnt Bridge Creek, China Ditch, China Lateral, Cougar Canyon Creek, Fifth Plain Creek, Lacamas Creek, Matney Creek, Mill Ditch, and Shanghai Creek

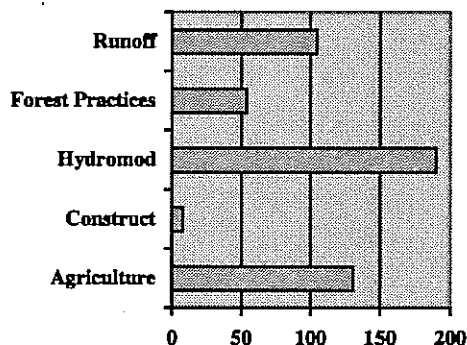
Fecal coliform in Burnt Bridge Creek, Columbia River, Gibbons Creek, Lacamas Creek, Lake River, Mill Creek, Salmon Creek, and Weaver Creek

High temperature in Burnt Bridge Creek, China Ditch, Columbia River, Fifth Plain Creek, Lacamas Creek, Lake River, Matney Creek, Salmon Creek, and Shanghai Creek

Total Dissolved Gas in Columbia River

pH in Burnt Bridge Creek, Dwyer Creek, Lacamas Creek, Matney Creek, Mill Ditch, and Shanghai Creek

Stream Miles Impacted by Source



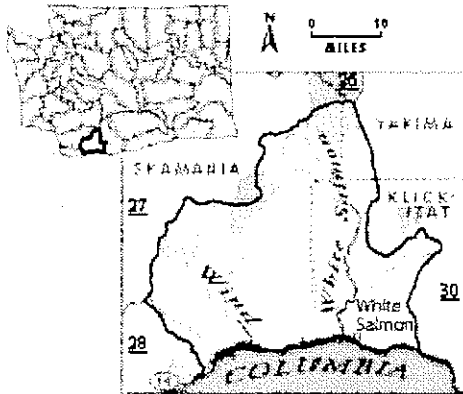
Unified Watershed Assessment Critical Environmental Information

Water	
Flow	Healthy
Quality	Threatened
TMDLs	Required
Public Health	
Shellfish	None
Drinking Water	Healthy
Nitrates	Healthy
Fish	
	Impaired

Water Quality Programs in WRIA #28

1. Clark County Wellhead Protection Program
2. Small Farm Water Quality Improvement, Clark CD
3. Aquifer Vulnerability Assessment, Clark County
4. Lacamas Lake Phase II Restoration, Clark County
5. Wellhead Protection Implementation Project, Clark County
6. West End Water Quality Analysis, Skamania County

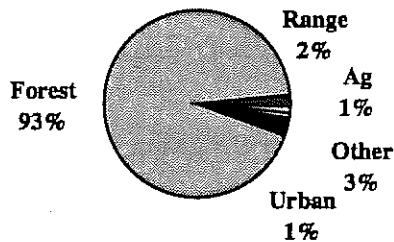
Wind-White Salmon Basin WRIA #29



WRIA #29 contains nearly 576,745 acres. This watershed is part of the Cascade and Eastern Cascade Slopes ecoregions. Rainfall averages 70 inches per year.

Demographics

Land use in the Wind/White Salmon Basin



Land Base

Federal	325,971	56.5%
State	74,936	13.0%
Local	-0-	-0-
Tribal	45	<.01%
Private	175,793	30.5%

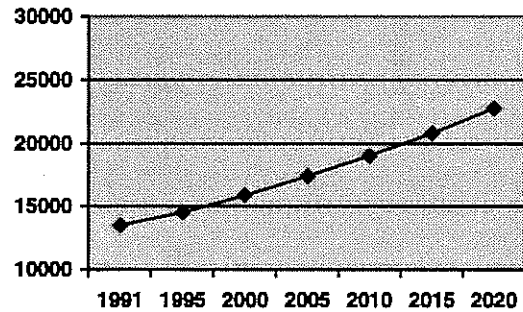
Principal Economic Activity (as total wages)

Agriculture/Forestry	2%
Manufacturing	14%
Retail Trade	10%
Services	26%
Government	42%
Other	6%

Population

There are approximately 14,528 people living in the Wind-White Salmon Basin. The primary population center is White Salmon. The majority of people live in unincorporated areas.

Projected population trends



Counties

Skamania (65%) Klickitat (31%)
Yakima (4%)

Special purpose districts

Conservation Districts: Underwood; Central Klickitat; South Yakima

Irrigation Districts: White Salmon; Bingen

Principal Cities

White Salmon Stevenson
Carson Home Valley
Hood Trout Lake

Reservation Lands

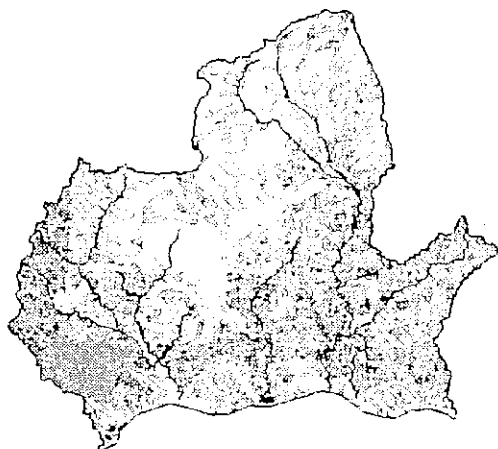
None

Environment

U-shaped glaciated valleys and steep dissected mountains with medium gradient streams. Eastern slope is low mountainous foothills. Typical soils include deep clay and silty clay loam, gravelly silt loam, and cobbly loam. Potential natural vegetation includes western hemlock, western red cedar, Pacific silver fir,

Douglas fir, noble fir, and ponderosa pine in the east. Mean temperature ranges from 26/41° (winter) to 53/82° (summer).

303(d) listed waterbodies



Total Maximum Daily Loads

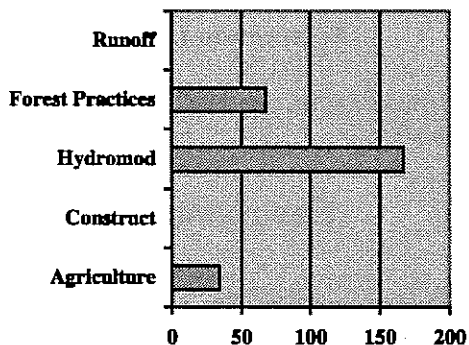
7 TMDLs required from the 1998 303(d) list

303(d) listed Problem Areas

High temperature in Bear Creek, Eightmile Creek, Indian Creek, Rattlesnake Creek, and Trout Lake Creek

Fecal coliform in Rattlesnake Creek, Trout Lake Creek, and White Salmon River

Stream Miles Impacted by Source



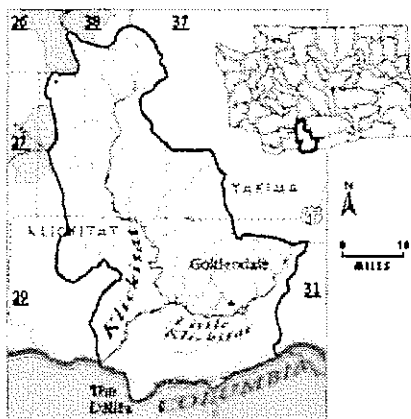
Unified Watershed Assessment Critical Environmental Information

Water	
Flow	Healthy
Quality	Healthy
TMDLs	In process
Public Health	
Shellfish	None
Drinking Water	Threatened
Nitrates	Healthy
Fish	Impaired

Water Quality Programs in WRIA #29

1. White Salmon Watershed Enhancement Project, Underwood CD
2. Wind River Watershed Project, Underwood CD
3. Jewett Creek Corridor Enhancement, Underwood CD
4. US Forest Service Northwest Forest Plan

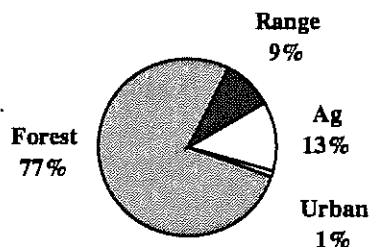
Klickitat Basin - WRIA #30



WRIA #30 encompasses about 918,850 acres. The Eastern Cascade Slopes and the Columbia Basin make up the watersheds ecoregions. Average rainfall is 31 inches.

Demographics

Land use in the Klickitat Basin



Land Base (in acres)

Federal	10,856	1.2%
State	81,749	8.9%
Local	-0-	-0-
Tribal	364,602	39.7%
Private	461,643	50.2%

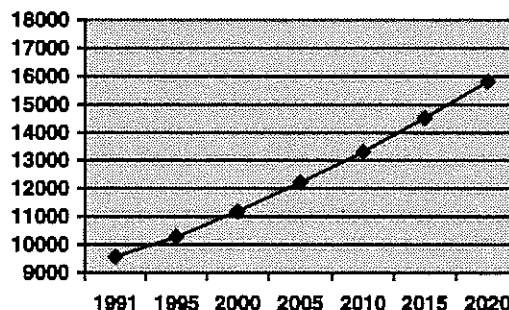
Principal Economic Activity (as total wages)

Agriculture/Forestry	9%
Manufacturing	24%
Retail Trade	10%
Services	10%
Government	27%
Other	20%

Population

There are approximately 10,267 people living in the Klickitat Basin. The primary population centers are Goldendale and Klickitat. The majority of people live in unincorporated areas.

Projected population trends



Counties

Klickitat (58%) Yakima (42%)

Special purpose districts

Conservation Districts: Central Klickitat; Eastern Klickitat; South Yakima; Underwood

Irrigation Districts: North Dalles

Principal Cities

Goldendale	Klickitat
Lyle	Dallesport
Maryhill	Centerville

Reservation Lands

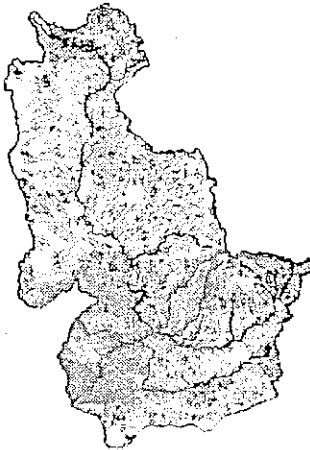
Confederated Tribes and Bands of the Yakama Indian Nation

Environment

High unglaciated plateaus, buttes, and canyons to low mountains and foothills. Permanent and intermittent streams that are high to medium gradient. Typical soils include moderately deep stony loam to very cobbly loam. Potential natural vegetation is ponderosa pine, Oregon white oak,

bitterbrush, Douglas fir, and grasslands. Mean temperature ranges from 18/40° (winter) to 52/82° (summer).

303(d) listed waterbodies



Total Maximum Daily Loads

4 TMDLs required from the 1998 303(d) list

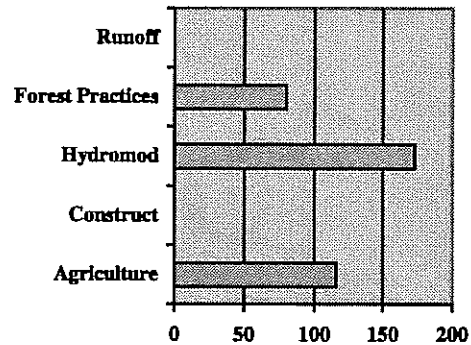
303(d) listed Problem Areas

Low instream flows in Blockhouse Creek, Bloodgood Creek, Bowman Creek, Little Klickitat River, Mill Creek, and Swale Creek

High temperature in Butler Creek, Columbia River, and Little Klickitat River

Total Dissolved Gas in Columbia River

Stream Miles Impacted by Source



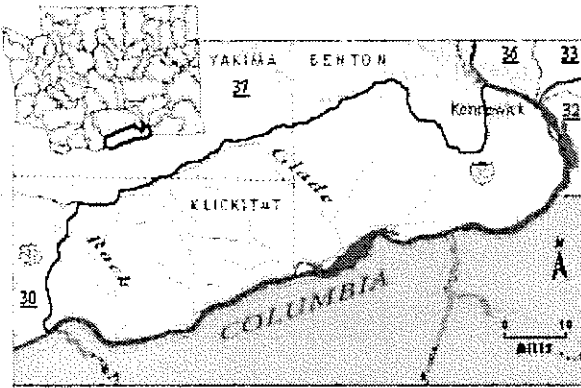
Unified Watershed Assessment Critical Environmental Information

Water	
Flow	Healthy
Quality	Healthy
TMDLs	In process
Public Health	
Shellfish	None
Drinking Water	Healthy
Nitrates	Healthy
Fish	Impaired

Water Quality Programs in WRIA #30

1. US Forest Service Northwest Forest Plan
2. Watershed Management Plan, Goldendale
3. Watershed Protection Improvements, Goldendale

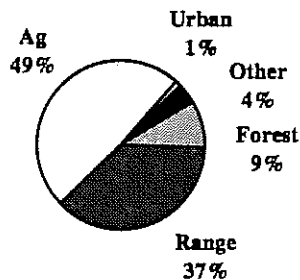
Rock-Glade Basin - WRIA #31



WRIA #31 is part of the Columbia Basin and Eastern Cascade Slopes ecological region. The watershed encompasses about 1,057,998 acres. Yearly rainfall averages 8 inches.

Demographics

Land use in the Rock/Glade Basin



Land Base (in acres)

Federal	23,316	2.2%
State	59,515	5.6%
Local	540	.1%
Tribal	421	<.1%
Private	974,206	92.1%

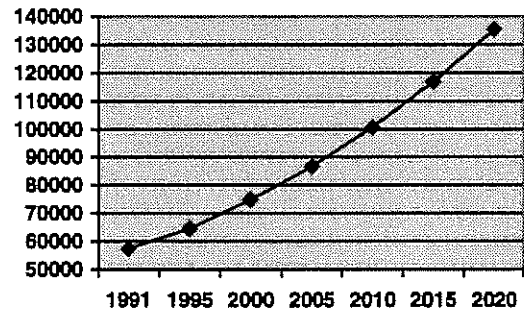
Principal Economic Activity (as total wages)

Agriculture	10%
Retail Trade	17%
Services	33%
Government	16%
Other	24%

Population

There are approximately 64,521 people living in the Rock-Glade Basin. The primary population centers are Kennewick and Plymouth. The majority of people live in unincorporated areas.

Projected population trends



Counties

Benton (50%) Klickitat (44%)
Yakima (6%)

Special purpose districts

Conservation Districts: Benton; Central Klickitat; Eastern Klickitat; South Yakima

Irrigation Districts: Columbia Water and Power, Kennewick

Principal Cities

Kennewick Plymouth
Paterson Roosevelt
Goodnoe Hills Bickleton

Reservation Lands

None

Environment

This landscape is composed of layer upon layer of basalt, and remnants of the Pleistocene lake basins. The typical soils are deep gravelly loam to silty loam. Potential natural vegetation is big sagebrush, bitterbrush, bluebunch wheatgrass, and Idaho fescue.

303(d) listed waterbodies



Total Maximum Daily Loads

0 TMDLs required from the 1998 303(d) list

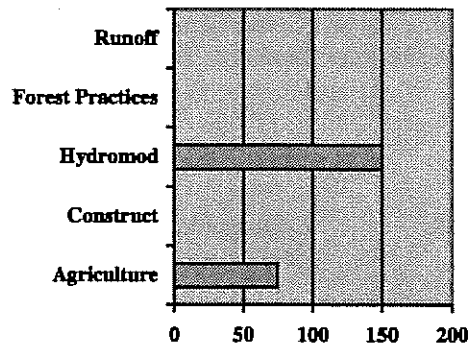
303(d) listed Problem Areas

Metals in the Columbia River

High temperatures in the Columbia River

Total Dissolved Gas in the Columbia River

Stream Miles Impacted by Source



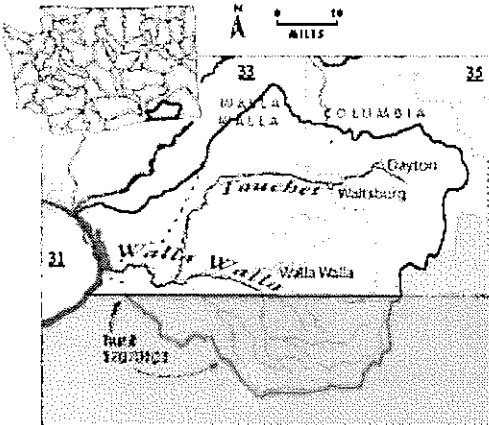
Unified Watershed Assessment Critical Environmental Information

Water	
Flow	Healthy
Quality	Impaired
TMDLs	None
Public Health	
Shellfish	None
Drinking Water	Threatened
Nitrates	Impaired
Fish	Healthy

Water Quality Programs in WRIA #31

1. Timber, Fish, Wildlife Project
2. Develop Best Management Practices, Benton CD

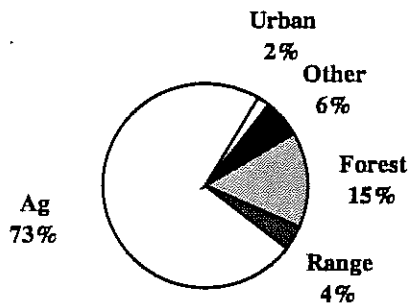
Walla Walla Basin - WRIA #32



WRIA #32 is contained within the Columbia Basin and Blue Mountains ecological regions. This watershed is about 908,812 acres. Average rainfall ranges between 5" in the lower elevations to 40" in the Blue Mountains.

Demographics

Land use in the Walla Walla Basin



Land Base (in acres)

Federal	47,442	5.2%
State	19,843	2.2%
Local	674	.1%
Tribal	-0-	-0-
Private	840,853	92.5%

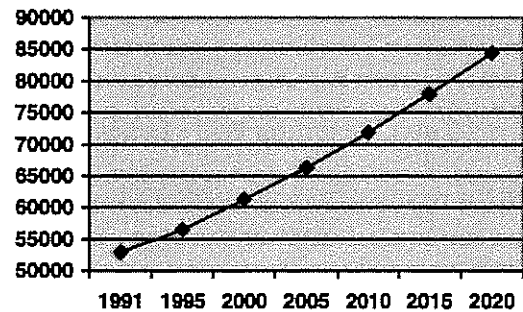
Principal Economic Activity (as total wages)

Manufacturing	25%
Government	34%
Retail Trade	10%
Agriculture	8%
Other	23%

Population

There are approximately 56,455 people living in the Walla Walla Basin. The primary population centers are Walla Walla and Dayton. The majority of people live in unincorporated areas.

Projected population trends



Counties

Walla Walla (72%)
Columbia (28%)

Special purpose districts

Conservation Districts: Walla Walla County; Columbia

Irrigation Districts: Hearn; West End; artesa; Blalock; Blalock Orchard; Consolidated; East Side; Gardena Farms; Green Tank; Hydro; Lowden; Mud Creek; Orchard; Touchet Valley; Walla Wall Water and Power; West Side

Principal Cities

Walla Walla College Place
Dayton Waitsburg

Reservation Lands

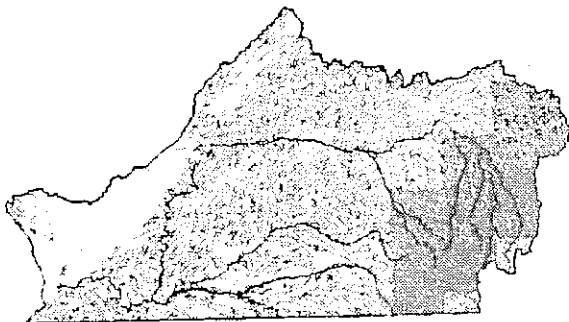
None

Environment

The Walla Walla basin is primarily rolling loessal duneland formations. Some of the formations were reworked by flooding when the flood waters of Lake Missoula backed up at Wallulla Gap.

Soils are typically deep loess on hills and foothills. Potential natural vegetation is big sagebrush, bluebunch wheatgrass, Idaho fescue, rabbit brush, and bitterbrush.

303(d) listed waterbodies



Total Maximum Daily Loads

15 TMDLs required from the 1998 303(d) list

303(d) listed Problem Areas

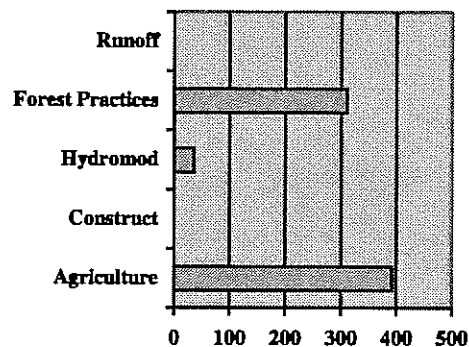
Fecal coliform in Touchet River and Walla Walla River

High temperature in Mill Creek, Touchet River, and Walla Walla River

Pesticides in Walla Walla River

Low instream flows in Mill Creek and Walla Walla River

Stream Miles Impacted by Source



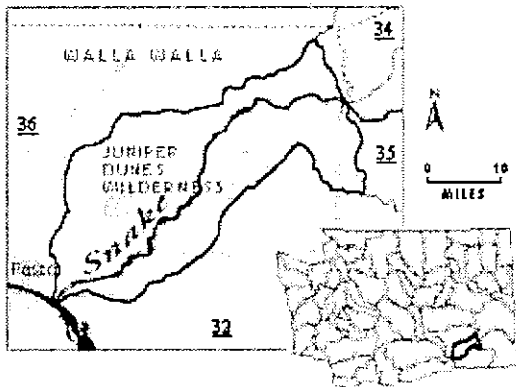
Unified Watershed Assessment Critical Environmental Information

Water	
Flow	Impaired
Quality	Impaired
TMDLs	Required
Public Health	
Shellfish	None
Drinking Water	Threatened
Nitrates	Impaired
Fish	Healthy

Water Quality Programs in WRIA #32

1. Touchet River Watershed Analysis, DNR
2. Watershed Restoration Plans for the Walla Walla River, Walla Walla CD
3. US Forest Service Northwest Forest Plan
4. Walla Walla Wellhead and Initial Aquifer Characterization Study, Walla Walla County
5. Onsite septic system technical assistance, Walla Walla Health and Columbia Health Districts

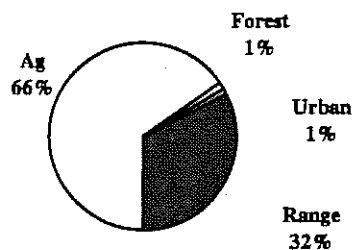
Lower Snake Basin - WRIA #33



WRIA #33 is located within the Columbia Basin ecosystem. This 461,472 acre watershed receives about 11 inches per year of rainfall.

Demographics

Land use in the Lower Snake Basin



Land Base (in acres)

Federal	26,712	5.8%
State	20,642	4.5%
Local	134	<.1%
Tribal	-0-	-0-
Private	413,984	89.7%

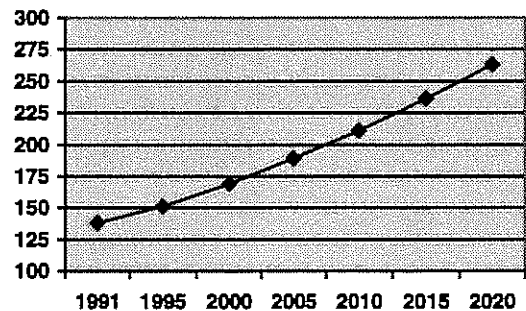
Principal Economic Activity (as total wages)

Agriculture	25%
Retail Trade	13%
Services	18%
Government	18%
Manufacturing	8%
Other	18%

Population

There are approximately 151 people living in the Lower Snake Basin. The majority of people live in unincorporated areas.

Projected population trends



Counties

Franklin (57%) Walla Walla (39%)
Columbia (4%)

Special purpose districts

Conservation Districts: Franklin; Walla Walla County; Columbia

Irrigation Districts: Burbank

Principal Cities

Page Burbank
Snake River Burbank Heights
Haas

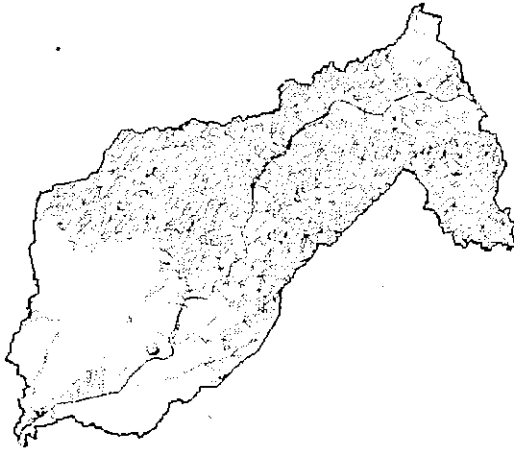
Reservation Lands

None

Environment

The scablands and loess islands were formed as immense floods periodically broke through the ice dams blocking glacial Lake Missoula during the Pleistocene. Soils are typically deep loess on hills and foothills. Potential natural vegetation is big sagebrush, bluebunch wheatgrass, Idaho fescue, and bitterbrush.

303(d) listed waterbodies



Total Maximum Daily Loads

1 TMDL required from the 1998 303(d) list

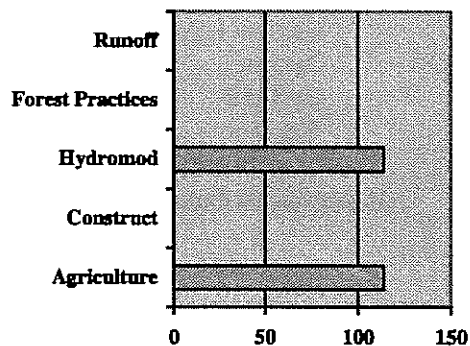
303(d) listed Problem Areas

High temperatures in the Snake River

Dissolved oxygen in the Snake River

Total Dissolved Gas in the Snake River

Stream Miles Impacted by Source



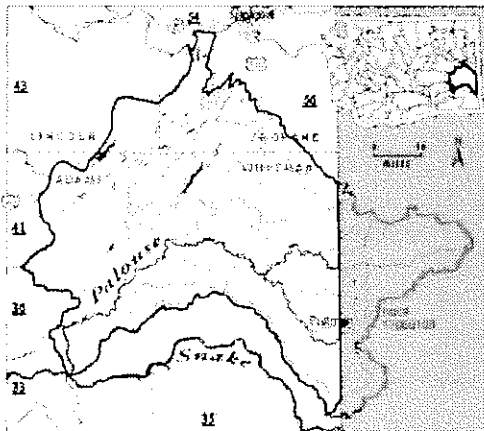
Unified Watershed Assessment Critical Environmental Information

Water	
Flow	Healthy
Quality	Impaired
TMDLs	In process
Public Health	
Shellfish	None
Drinking Water	Healthy
Nitrates	Impaired
Fish	Healthy

Water Quality Programs in WRIA #33

1. Agricultural Technical Assistance Project, Franklin CD
2. Aquifer Protection Through Chemigation Laws, Franklin CD
3. Study on the effects of irrigation on groundwater, Franklin CD
4. Mid-Columbia Basin Ground Water Management Area, Franklin County
5. Onsite Septic System Technical Assistance, Walla Walla County Health

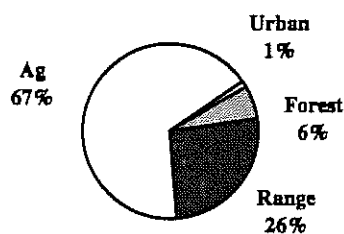
Palouse Basin - WRIA #34



WRIA #34 encompasses about 1,765,345 acres. Located in the heart of the Palouse, this watershed receives an average annual rainfall of 13 inches per year. It is part of the Columbia Basin ecoregion.

Demographics

Land use in the Palouse Basin



Land Base (in acres)

Federal	18,828	1.1%
State	68,769	3.9%
Local	-0-	-0-
Tribal	-0-	-0-
Private	1,677,748	95.0%

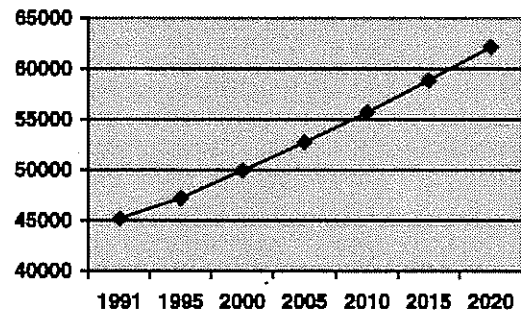
Principal Economic Activity (as total wages)

Agriculture/Forestry	4%
Retail Trade	17%
Services	12%
Government	50%
Other	18%

Population

There are approximately 47,238 people living in the Palouse Basin. The primary population centers are Pullman, Medical Lake, and Colfax. Nearly one half of the population live in unincorporated areas.

Projected population trends



Counties

Whitman (62%)	Adams (20%)
Spokane (13%)	Lincoln (4%)
Franklin (1%)	

Special purpose districts

Conservation Districts: Palouse-Rock Lake; Pine Creek; Palouse; Whitman; Adams; Spokane County; Lincoln County

Principal Cities

Pullman	Medical Lake
Colfax	Palouse
Rosalia	Garfield
St. John	Sprague

Reservation Lands

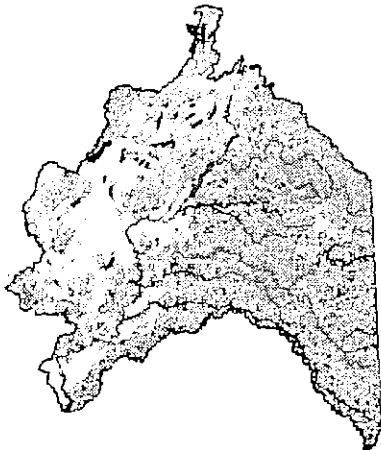
None

Environment

The Palouse Basin is characterized by dune-like ridges, deep loess soils, and low gradient intermittent streams. Soils are high in organic matter and clay, and are highly productive. The

potential natural vegetation is the fescue-snowberry plant association.

303(d) listed waterbodies



Total Maximum Daily Loads

31 TMDLs required from the 1998 303(d) list

303(d) listed Problem Areas

Fecal coliform in Missouri Flat Creek, Palouse River, Paradise Creek, and Rebel Flat Creek

Dissolved oxygen in Missouri Flat Creek, Palouse River, Paradise Creek, Pine Creek, and Rebel Flat Creek

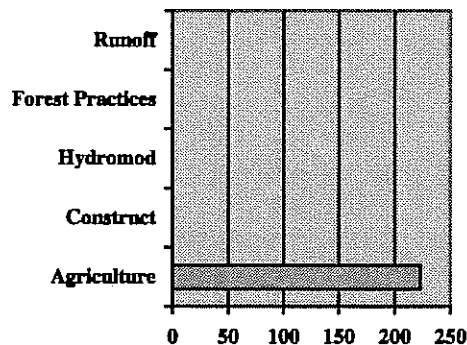
High temperature in Palouse River, Paradise Creek, Pine Creek, Rock Creek, and Union Flat Creek

Metals in the Palouse River

Pesticides in the Palouse River

pH in Palouse River, Pine Creek, and Rock Creek

Stream Miles Impacted by Source



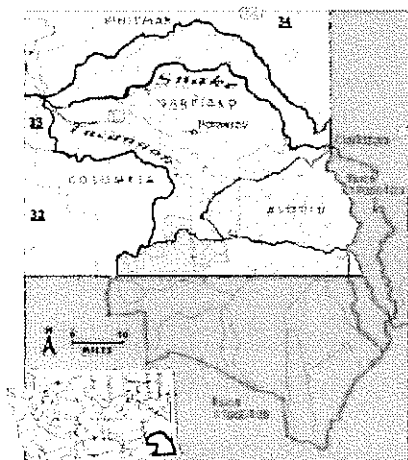
Unified Watershed Assessment Critical Environmental Information

Water	
Flow	Healthy
Quality	Impaired
TMDLs	In process
Public Health	
Shellfish	None
Drinking Water	Healthy
Nitrates	Impaired
Fish	Healthy

Water Quality Programs in WRIA #34

1. Paradise Creek Watershed Plan, Palouse CD
2. Missouri Flat Creek Watershed Plan, Palouse CD
3. South Fork Palouse Watershed Council, Palouse CD
4. South Fork Palouse River Revegetation Project, Palouse CD
5. Trees on the Palouse, Palouse CD
6. Riparian Education Project, Whitman CD
7. Onsite Septic System Technical Assistance, Whitman County Health
8. Evaluation of Dryland BMPs on Water Quality, WSU
9. Paradise Creek Bioengineering, WSU
10. Pullman-Moscow Ground Water Model Update, City of Pullman

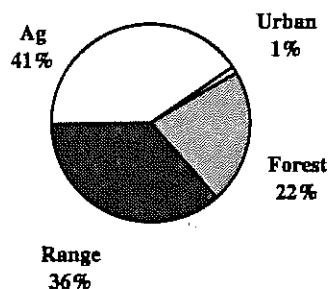
Middle Snake Basin - WRIA #35



WRIA #35 encompasses about 1,440,130 acres of Columbia Basin and Blue Mountain ecoregions. This watershed drains the Snake River and receives an average rainfall of 17 inches.

Demographics

Land use in the Middle Snake Basin



Land Base (in acres)

Federal	279,254	19.4%
State	65,751	4.5%
Local	31	<.01%
Tribal	-0-	-0-
Private	1,095,094	76.1%

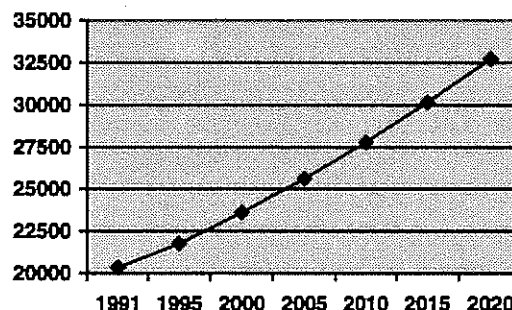
Principal Economic Activity (as total wages)

Services	30%
Government	18%
Retail Trade	26%
Wholesale Trade	16%
Agriculture	10%

Population

There are approximately 21,744 people living in the Middle Snake Basin. The primary population centers are Clarkston, Asotin, and Pomeroy. The majority of people live in unincorporated areas.

Projected population trends



Counties

Garfield (32%)	Asotin (28%)
Whitman (20%)	Columbia (20%)

Special purpose districts

Conservation Districts: Palouse; Whitman; Columbia; Pomeroy; Asotin County

Principal Cities

Clarkston	Pomeroy
Asotin	Starbuck

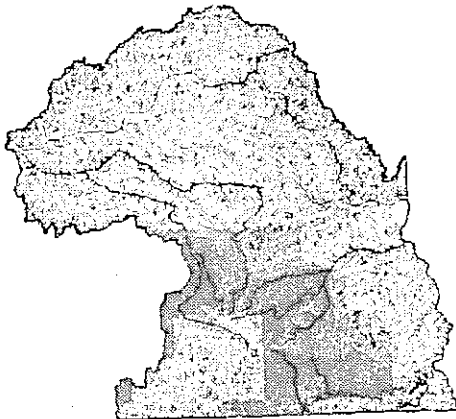
Reservation Lands

None

Environment

This basin is comprised of canyons and highly dissected land forms. The uplifted Columbia basalt plateau has been eroded into a series of knife-edge ridges cut by deep canyons. Soils are a mixture of colluvial canyon soil and soil with a loess or ash mantle. Potential natural vegetation ranges from bunchgrass to Douglas fir with intervening ponderosa pine.

303(d) listed waterbodies



Total Maximum Daily Loads

4 TMDLs required from the 1998 303(d) list

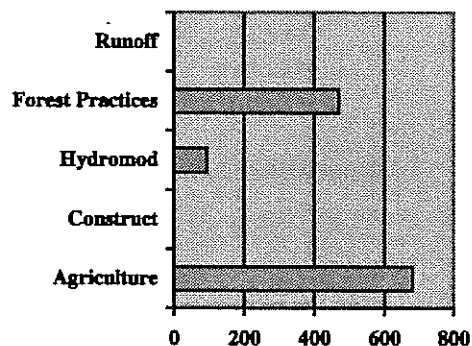
303(d) listed Problem Areas

Fecal coliform in Asotin Creek and Pataha Creek

High temperatures in the Snake River and Tucannon River

Total Dissolved Gas in Snake River

Stream Miles Impacted by Source



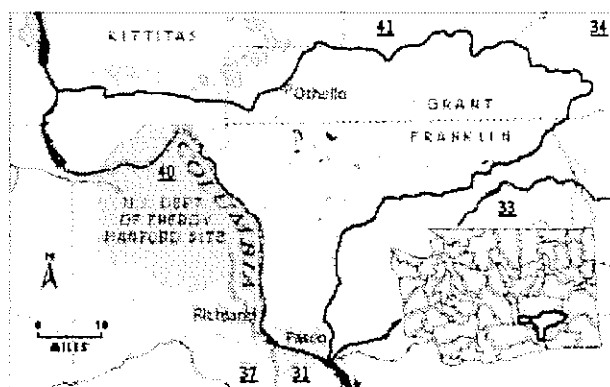
Unified Watershed Assessment Critical Environmental Information

Water	
Flow	Threatened
Quality	Impaired
TMDLs	In process
Public Health	
Shellfish	None
Drinking Water	Healthy
Nitrates	Healthy
Fish	Impaired

Water Quality Programs in WRIA #35

1. Asotin Creek Model Watershed Project, Asotin CD
2. Pataha Creek Model Watershed Project
3. Tucannon River Model Watershed Plan, 1997 Columbia CD
4. Tucannon River Basin Improvement Project Phase II, Columbia CD
5. US Forest Service Northwest Forest Plan

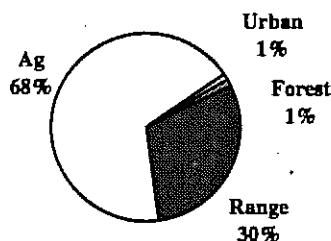
Esquatzel Coulee Basin - WRIA #36



WRIA #36 drains about 1,058,960 acres. This watershed is located within the Columbia Basin ecoregion. It receives only 6 inches of rainfall per year.

Demographics

Land use in the Esquatzel Basin



Land Base (in acres)

Federal	295,637	27.9%
State	32,889	3.1%
Local	-0-	-0-
Tribal	-0-	-0-
Private	730,434	69.0%

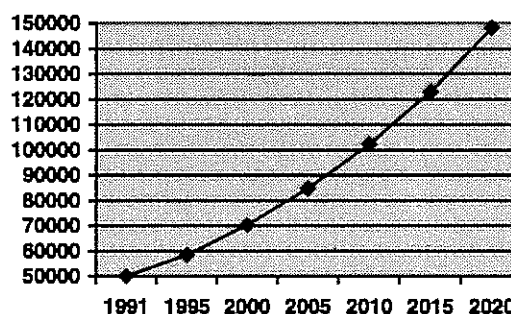
Principal Economic Activity (as total wages)

Agriculture	25%
Retail Trade	13%
Services	18%
Government	18%
Manufacturing	8%
Other	18%

Population

There are approximately 58,290 people living in the Esquatzel Coulee Basin. The primary population centers are Othello and Pasco. The majority of people live in unincorporated areas.

Projected population trends



Counties

Franklin (50%) Adams (33%)
Grant (17%)

Special purpose districts

Conservation Districts: Franklin; Adams; Warden

Irrigation Districts: Franklin County; South Columbia

Principal Cities

Pasco Othello
Connell Mattawa
Mesa Washtuca

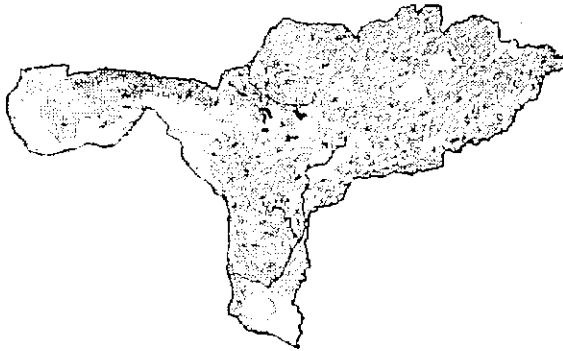
Reservation Lands

None

Environment

The scablands and loess islands were formed as immense floods periodically broke through the ice dams blocking glacial Lake Missoula during the Pleistocene. Soils are typically deep loess on hills and foothills. Potential natural vegetation is big sagebrush, bluebunch wheatgrass, Idaho fescue, and three-tip sagebrush.

303(d) listed waterbodies



Total Maximum Daily Loads

8 TMDLs required from the 1998 303(d) list

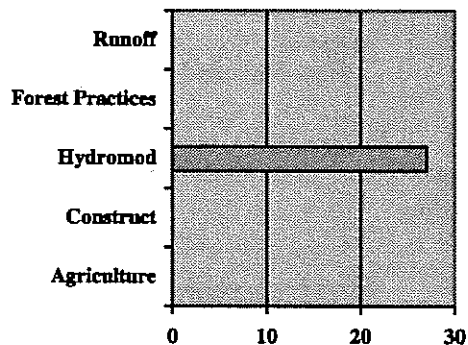
303(d) listed Problem Areas

High temperature in East Potholes Canal, Esquatzel Coulee, Mattawa Drain, Mattawa Wasteway, Potholes Canal, and Scooteney Wasteway

Dissolved oxygen in East Potholes Canal, Esquatzel Coulee, Potholes Canal, and Scooteney Wasteway

pH in Columbia River, Esquatzel Coulee, and Scooteney Wasteway

Stream Miles Impacted by Source



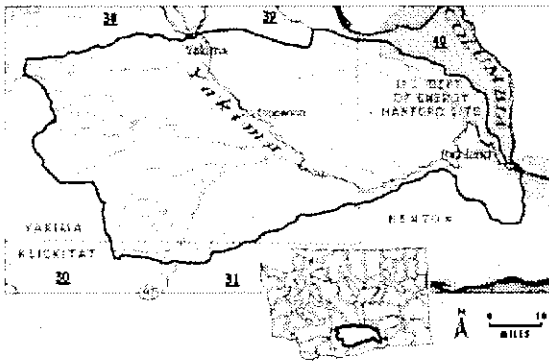
Unified Watershed Assessment Critical Environmental Information

Water	
Flow	Healthy
Quality	Impaired
TMDLs	Required
Public Health	
Shellfish	None
Drinking Water	Impaired
Nitrates	Impaired
Fish	Healthy

Water Quality Programs in WRIA #36

1. Mid-Columbia Watershed Planning, Grant County
2. Mid-Columbia Basin Ground Water Management Area, Franklin County
3. Block 17 Subwatershed Agricultural Implementation, Franklin CD
4. Environmental Education Guide, Adams CD
5. Othello Water Quality Project, Othello CD

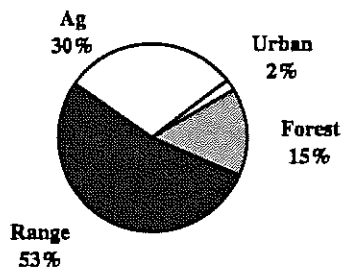
Lower Yakima Basin - WRIA #37



WRIA #37 is a 1,862,225 acre watershed. The majority of the watershed is in the Columbia Basin ecoregion, with a smaller portion in the Eastern Cascade Slopes. Rainfall varies from over 80" in the higher elevations to less than 10" at Kennewick.

Demographics

Land use in the Lower Yakima Basin



Land Base (in acres)

Federal	222,524	12.0%
State	75,028	4.0%
Local	569	<.1%
Tribal	889,943	47.8%
Private	674,161	36.2%

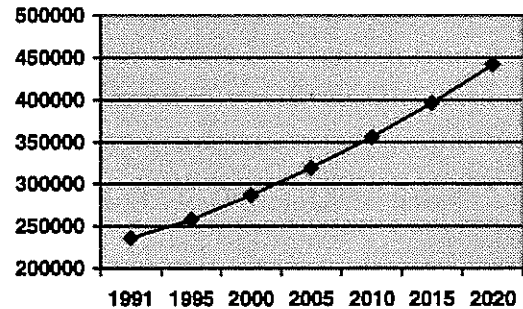
Principal Economic Activity (as total wages)

Agriculture/Forestry	21%
Manufacturing	12%
Retail Trade	15%
Services	20%
Government	14%
Other	18%

Population

There are approximately 257,429 people living in the Lower Yakima Basin. The primary population centers are Yakima, Sunnyside, and Toppenish. The majority of people live in unincorporated areas.

Projected population trends



Counties

Yakima (74%) Benton (24%)
Klickitat (2%)

Special purpose districts

Conservation Districts: South Yakima; North Yakima; Benton; Eastern Klickitat

Irrigation Districts: Benton; Columbia; Grandview; Kennewick; Kiona; Prosser; Ahtanum; Buena; Home; Outlook; Roza-Sunnyside Joint Board; Selah-Moxee; Snipes Mountain; Terrace Heights; Union Gap; Wenas; City of Yakima; Yakima-Tieton; Zillah; Wapato

Principal Cities

Yakima	Sunnyside	Moxee
Toppenish	Grandview	Ahtanum
Prosser	West Richland	Union Gap

Reservation Lands

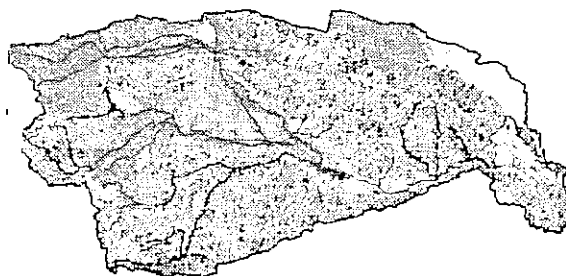
Confederated Tribes and Bands of the Yakama Indian Nation

Environment

The upper basin is a series of anticlinal ridges and synclinal valleys. The lower basin was formed

primarily through the flooding of Lake Missoula. Flood waters tearing through the basin dropped their load of loess, sand, and outwash gravel. Native vegetation consist of big sagebrush/bluebunch wheatgrass associations in the desert lowlands and Ponderosa Pine/Doug fir in the higher elevations.

303(d) listed waterbodies



Total Maximum Daily Loads

50 TMDLs required from the 1998 303(d) list

303(d) listed Problem Areas

Pesticides in Granger Drain, Moxee Drain, Sulphur Creek Wasteway, Wide Hollow Creek, and Yakima River

Fecal coliform in Granger Drain, Moxee Drain, Wide Hollow Creek, and Yakima River

High temperature in Granger Drain, Moxee Drain, Spring Creek, Sulphur Creek Wasteway, Wide Hollow Creek, and Yakima River

Dissolved oxygen in Granger Drain, Moxee Drain, Snipes Creek, and Yakima River

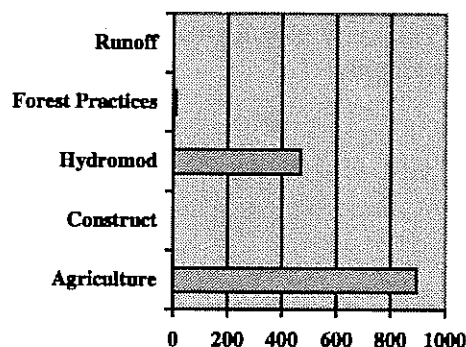
Metals in Yakima River

Ammonia in Granger Drain

pH in Granger Drain and Yakima River

Low instream flows in Yakima River

Stream Miles Impacted by Source



Unified Watershed Assessment Critical Environmental Information

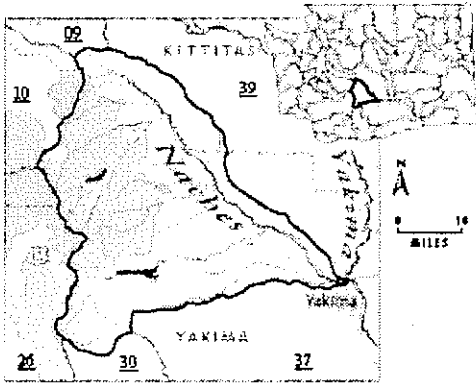
Water	
Flow	Impaired
Quality	Impaired
TMDLs	In process
Public Health	
Shellfish	None
Drinking Water	Threatened
Nitrates	Impaired
Fish	Threatened

Water Quality Programs in WRIA #37

1. Yakima River Water Quality Management Plan, Yakima Valley Council of Governments
2. Moxee Drain Irrigated Agriculture BMP Implementation, North Yakima CD
3. Moxee Watershed Plan - PL566, NRCS and North Yakima CD
4. Environmental Quality Incentives Program (EQIP), NRCS
5. Water Quality Monitoring Project, North Yakima CD
6. Lower Yakima River Suspended Sediment TMDL, Ecology
7. Dairy Waste Assistance, South Yakima CD
8. Giffin Lake Watershed Planning, South Yakima CD
9. Sulphur Creek BMP Implementation, South Yakima CD
10. Stormwater Quality Management Plan, City of Yakima
11. Ground water monitoring of the Toppenish Basin, Yakama Indian Nation

12. Enclose Conduits and Canal Automation,
Roza ID
13. Enclose Conduits, Sunnyside ID
14. Upper Yakima Valley Wellhead Protection,
Yakima County

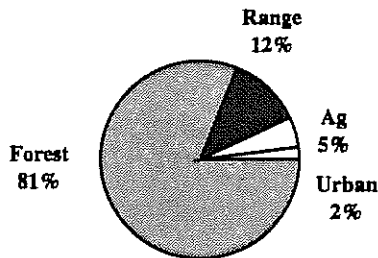
Naches Basin - WRIA #38



WRIA #38 encompasses about 709,990 acres. This watershed is located within the Eastern Cascade Slope, Cascade, and Columbia Basin ecoregions. It receives nearly 46 inches of rainfall per year.

Demographics

Land use in the Naches Basin



Land Base (in acres)

Federal	510,751	71.9%
State	60,590	8.5%
Local	-0-	-0-
Tribal	139	<.1%
Private	138,510	19.5%

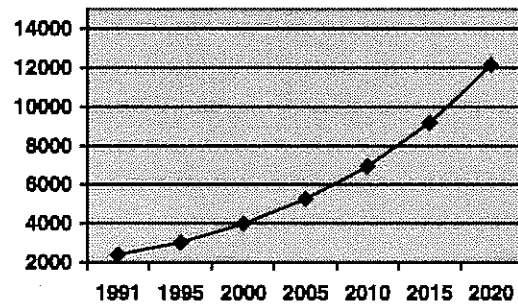
Principal Economic Activity (as total wages)

Agriculture/Forestry	21%
Services	20%
Retail Trade	15%
Government	14%
Manufacturing	12%

Population

There are approximately 3,006 people living in the Naches Basin. The primary population centers are Yakima, Tieton, and Naches. The majority of people live in unincorporated areas.

Projected population trends



Counties

Yakima (90%) Kittitas (10%)

Special purpose districts

Conservation Districts: North Yakima

Irrigation Districts: Yakima-Tieton; South Naches; Naches-Selah; Wapato

Principal Cities

Yakima Tieton
Naches

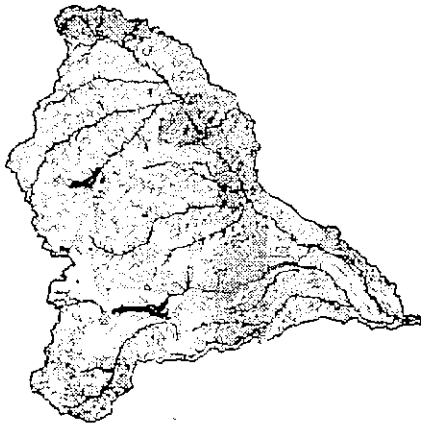
Reservation Lands

None

Environment

High mountains, plateaus, and buttes, both glaciated and unglaciated. Perennial streams are high to medium gradient. Typical soils include stony loam, sandy loam, and gravelly loam. Potential natural vegetation is ponderosa pine, bitterbrush, Oregon white oak, grand fir, and Douglas fir. Mean temperature ranges from 16/35° (winter) to 47/82° (summer).

303(d) listed waterbodies



Total Maximum Daily Loads

32 TMDLs required from the 1998 303(d) list

303(d) listed Problem Areas

High temperatures in American River, Bear Creek, Blowout Creek, Bumping River, Cowiche Creek, Crow Creek, Gold Creek, Little Naches River, Little Rattlesnake Creek, Mathew Creek, Naches River, Rattlesnake Creek, Reynolds Creek, Tieton River, Yakima-Tieton Main Canal, and Nile Creek

Fecal coliform in Cowiche Creek

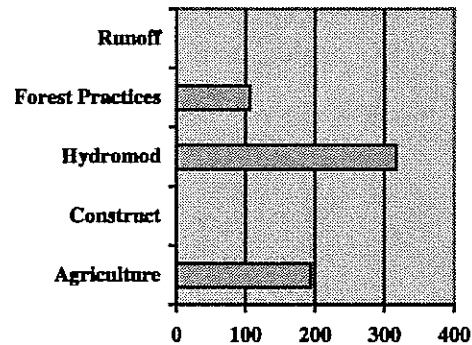
Low instream flows in Cowiche Creek

pH in Naches River

Metals in Naches River

Ammonia in Myron Lake

Stream Miles Impacted by Source



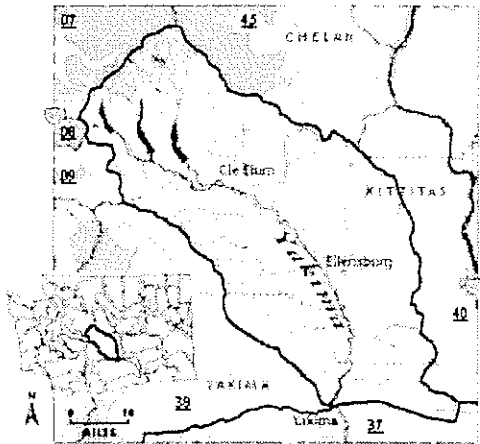
Unified Watershed Assessment Critical Environmental Information

Water	
Flow	Threatened
Quality	Healthy
TMDLs	In process
Public Health	
Shellfish	None
Drinking Water	Healthy
Nitrates	Impaired
Fish	Impaired

Water Quality Programs in WRIA #38

1. US Forest Service Watershed Analysis for: Little Naches; Naches Mainstem; Wenas Creek; Bumping and American River; upper and lower Tieton; Oak Creek; and Rattlesnake Creek.
2. DNR Watershed Analysis for Naches Pass; Cowiche Creek; and Reynolds Creek.
3. Water Quality Monitoring, North Yakima CD
4. Conservation Reserve Enhancement Project (CREP), NRCS
5. US Forest Service Northwest Forest Plan
6. Upper Yakima Valley Wellhead Protection, Yakima County
7. Yakima Basin Water Quality Plan, Yakima Valley Conference of Governments
8. Enclose irrigation canal, Naches-Selah Irrigation District

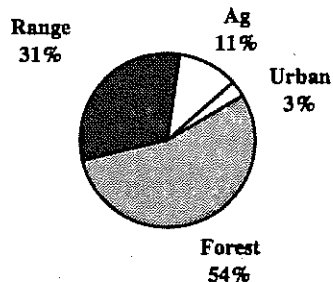
Upper Yakima Basin - WRIA #39



WRIA #39 encompasses nearly 1,366,935 acres. The Cascades and Columbia Basin ecoregions make up most of this watershed. Rainfall averages 30 inches per year.

Demographics

Land use in the Upper Yakima



Land Base (in acres)

Federal	495,740	36.3%
State	216,125	15.8%
Local	33	<.01%
Tribal	-0-	-0-
Private	655,037	47.9%

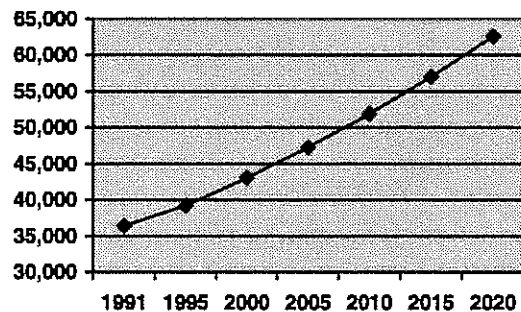
Principal Economic Activity (as total wages)

Agriculture/Forestry	7%
Retail Trade	24%
Services	19%
Government	33%
Other	17%

Population

There are approximately 39,216 people living in the Upper Yakima Basin. The primary population centers are Ellensburg and Cle Elum. The majority of people live in unincorporated areas.

Projected population trends



Counties

Kittitas (85%)
Yakima (15%)

Special purpose districts

Conservation Districts: Kittitas County; North Yakima

Irrigation Districts: Cascade; Kittitas Reclamation; Wenas; Roza; Selah-Moxee; and Westside

Principal Cities

Ellensburg
Cle Elum
Kittitas
Selah
Roslyn

Reservation Lands

None

Environment

Upper elevation is mountainous with V-shaped valleys with high gradient streams. Kittitas Valley is a synclinal dip with deposition from surrounding mountains. Native vegetation consist of Grand Fir, Douglas Fir, Ponderosa Pine and big sagebrush/ bluebunch wheatgrass associations.

303(d) listed waterbodies



Total Maximum Daily Loads

48 TMDLs required from the 1998 303(d) list

303(d) listed Problem Areas

High temperatures in Big Creek, Blue Creek, Cabin Creek, Cle Elum River, Cherry Creek, Cooke Creek, Cooper River, Gale Creek, Gold Creek, Iron Creek, Log Creek, Lookout Creek, Manastash Creek, Meadow Creek, Naneum Creek, Stafford Creek, Swauk Creek, Taneum Creek, Teanaway River, Thorp Creek, Waptus River, Wilson Creek, Yakima River, and Williams Creek

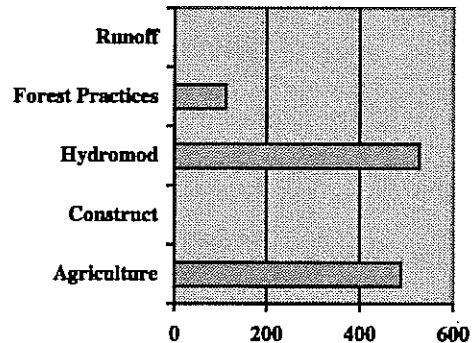
Low instream flows in Big Creek, Manastash Creek, Taneum Creek, Teanaway River, and Wenas Creek

Pesticides in Cherry Creek and Yakima River

Fecal coliform in Cooke Creek and Wilson Creek

Metals in Yakima River

Stream Miles Impacted by Source



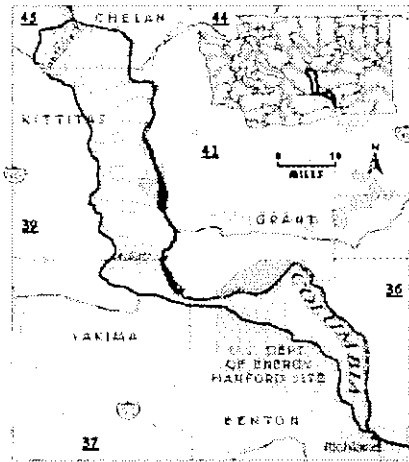
Unified Watershed Assessment Critical Environmental Information

Water	
Flow	Impaired
Quality	Healthy
TMDLs	In process
Public Health	
Shellfish	None
Drinking Water	Healthy
Nitrates	Healthy
Fish	Impaired

Water Quality Programs in WRIA #39

1. Yakima Training Center Erosion Control, US Army
2. TMDL for sediments and pesticides, Ecology
3. Teanaway River Temperature Control
4. US Forest Service watershed analysis for Cle Elum, Swauk Creek, Teanaway River, Table Mountain, Box Canyon, Yakima Basin, and Taneum Creek.
5. DNR watershed analysis for Big Creek, Quartz Mountain, Teanaway North, West Teanaway, Alps, Naneum Creek, Keechelus, and Mosquito Creek
6. US Forest Service Northwest Forest Plan
7. Kittitas Valley Water Quality Project, Kittitas CD
8. Onsite Sewage Homeowner Awareness, Kittitas County Health

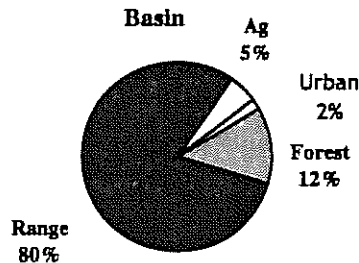
Alkali-Squillchuck Basin - WRIA #40



WRIA #40 encompasses about 541,356 acres. Bordering the Columbia River, this watershed is within the Columbia Basin and Cascade ecoregions. Average rainfall is 18 inches a year.

Demographics

Land use in the Alkali/Squillchuck Basin



Land Base (in acres)

Federal	250,711	46.3%
State	159,006	29.4%
Local	-0-	-0-
Tribal	-0-	-0-
Private	131,639	24.3%

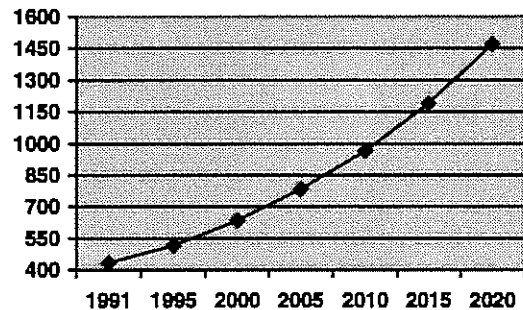
Principal Economic Activity (as total wages)

Agriculture	28%
Manufacturing	16%
Retail Trade	12%
Government	19%
Other	25%

Population

There are approximately 514 people living in the Alkali-Squillchuck Basin. The primary population center is Richland. The majority of people live in unincorporated areas.

Projected population trends



Counties

Kittitas (48%)	Benton (29%)
Chelan (14%)	Yakima (9%)

Special purpose districts

Conservation Districts: Kittitas County, Benton, Chelan County, North Yakima, South Yakima

Principal Cities

Richland Hanford
Wenatchee Heights Malaga

Reservation Lands

None

Environment

The basin was formed primarily through the flooding of Lake Missoula. Flood waters tearing through the basin dropped their load of loess, sand, and outwash gravel. Native vegetation consist of big sagebrush and bluebunch wheatgrass associations.

303(d) listed waterbodies



Total Maximum Daily Loads

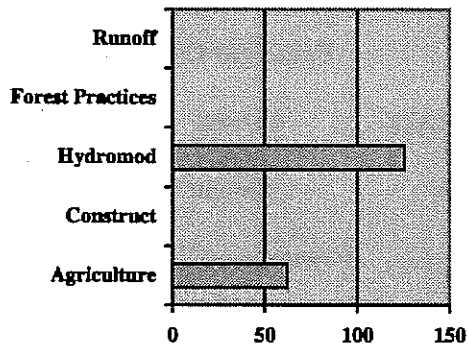
0 TMDLs required from the 1998 303(d) list

303(d) listed Problem Areas

Total dissolved gas in Columbia River

Radioactive material at the Hanford Reservation

Stream Miles Impacted by Source



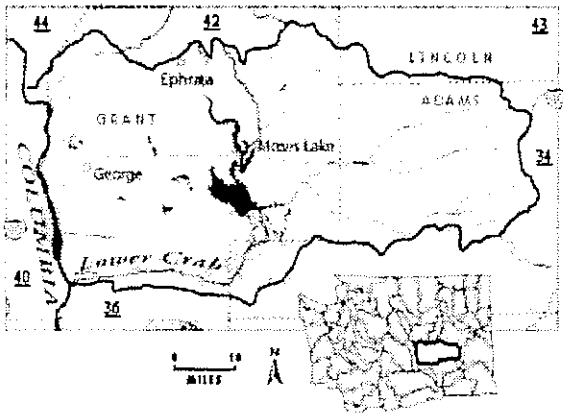
Unified Watershed Assessment Critical Environmental Information

Water	
Flow	Healthy
Quality	Impaired
TMDLs	None required
Public Health	
Shellfish	None
Drinking Water	Healthy
Nitrates	Healthy
Fish	Healthy

Water Quality Programs in WRIA #40

1. Instream flows of Columbia River under 173-563.WAC, Ecology
2. Kittitas Valley Water Quality, Kittitas CD
3. Stormwater Treatment Project, Kittitas County Water District #2

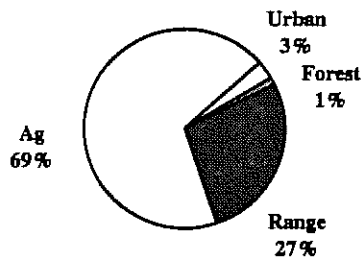
Lower Crab Basin - WRIA #41



WRIA #41 encompasses about 1,622,130 acres. This watershed is located within the Columbia Basin ecoregion. It only averages 6 inches of rain per year.

Demographics

Land use in the Lower Crab Basin



Land Base (in acres)

Federal	276,755	17.1%
State	89,007	5.5%
Local	-0-	-0-
Tribal	-0-	-0-
Private	1,256,368	77.4%

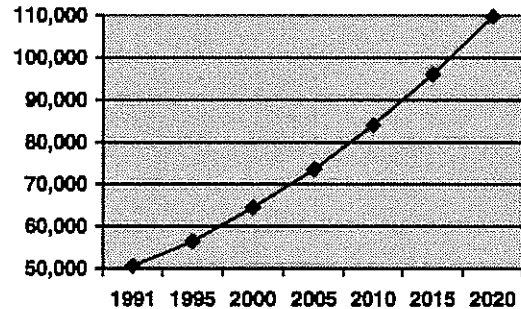
Principal Economic Activity (as total wages)

Agriculture	28%
Manufacturing	16%
Retail Trade	12%
Government	19%
Other	25%

Population

There are approximately 56,435 people living in the Lower Crab Basin. The primary population centers are Moses Lake, Ephrata, and Quincy.

Projected population trends



Counties

Grant (66%) Adams (32%)
Lincoln (2%)

Special purpose districts

Conservation Districts: Upper Grant; Lincoln; Adams; Warden

Irrigation Districts: East Columbia Basin; Quincy-Columbia Basin; Moses Lake Irrigation and Rehabilitation

Principal Cities

Moses Lake Ephrata
Othello Quincy
Ritzville Warden

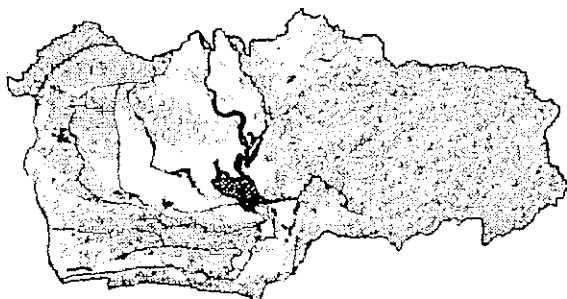
Reservation Lands

None

Environment

The scablands and loess islands were formed as immense floods periodically broke through the ice dams blocking glacial Lake Missoula during the Pleistocene. Soils are typically deep loess on hills and foothills. Potential natural vegetation is big sagebrush, bluebunch wheatgrass, Idaho fescue, and three-tip sagebrush.

303(d) listed waterbodies



Total Maximum Daily Loads

26 TMDLs required from the 1998 303(d) list

303(d) listed Problem Areas

High temperatures in Crab Creek, East Potholes Canal, Frenchman Hills Wasteway, Lind Coulee, Red Rock Coulee, Rocky Ford Creek, Sand Hollow Creek, W645W Wasteway, West Canal, and Winchester Wasteway

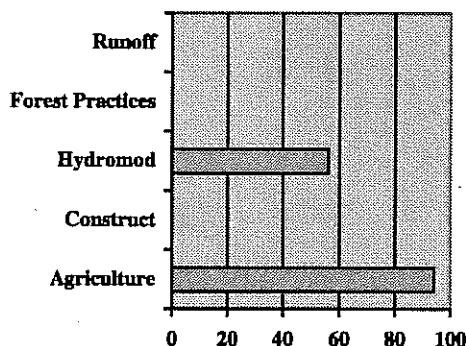
pH in Crab Creek, Frenchman Hills Wasteway, Lind Coulee, Red Rock Coulee, Sand Hollow Creek, and Winchester Wasteway

Dissolved oxygen in East Potholes Canal, Lind Coulee, Red Rock Coulee, Rocky Ford Creek, and W645W Wasteway

Pesticides in Crab Creek and Potholes Lake

PCBs in Crab Creek

Stream Miles Impacted by Source



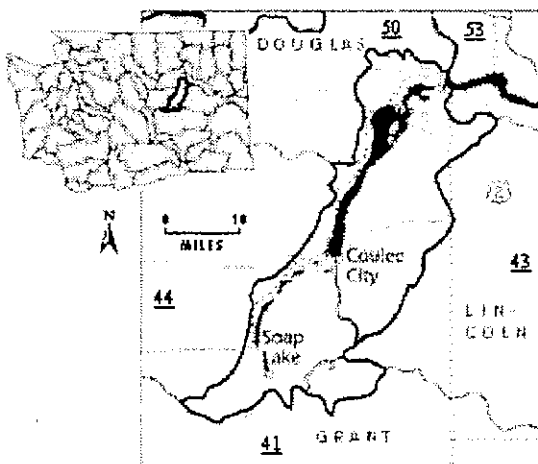
Unified Watershed Assessment Critical Environmental Information

Water	
Flow	Healthy
Quality	Impaired
TMDLs	In process
Public Health	
Shellfish	None
Drinking Water	Healthy
Nitrates	Impaired
Fish	
Fish	Healthy

Water Quality Programs in WRIA #41

1. Ground Water Management Area plan for the Mid-Columbia
2. Nitrate Monitoring and Wellhead Protection Program, City of Quincy
3. Othello/Warden Irrigation Management Project
4. Othello Water Quality Project, Othello CD
5. Local Solutions for Nitrate Reduction, Othello CD
6. Mid Columbia Watershed Planning, Grant County
7. Agricultural BMP Implementation, Adams CD
8. Weber Coulee Watershed Planning and Implementation, Adams CD
9. Lind Coulee Water Quality Project, Warden CD

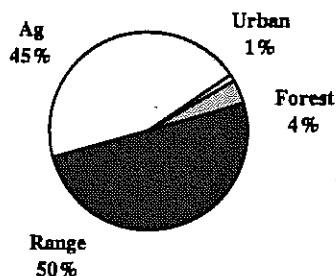
Grand Coulee Basin - WRIA #42



WRIA #42 lies in the heart of the Columbia Basin ecoregion. This watershed drains nearly 482,825 acres. It receives about 7 inches of rain per year.

Demographics

Land use in the Grand Coulee Basin



Land Base (in acres)

Federal	41,723	8.6%
State	42,818	8.9%
Local	25	<.01%
Tribal	-0-	-0-
Private	398,259	82.5%

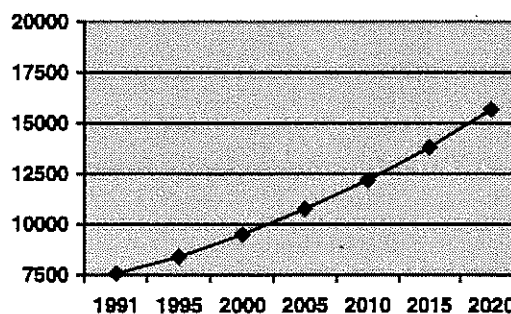
Principal Economic Activity (as total wages)

Agriculture/Forestry	25%
Government	20%
Manufacturing	16%
Retail Trade	15%
Other	24%

Population

There are approximately 8,384 people living in the Grand Coulee Basin. The primary population centers are Ephrata and Soap Lake. The majority of people live in unincorporated areas.

Projected population trends



Counties

Grant (83%) Douglas (14%)
Lincoln (3%)

Special purpose districts

Conservation Districts: Upper Grant; Lincoln County; Foster Creek

Principal Cities

Ephrata Soap Lake
Grand Coulee Electric City
Coulee City Hartline

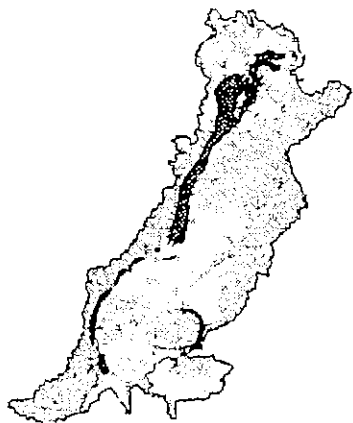
Reservation Lands

None

Environment

The scablands and loess islands were formed as immense floods periodically broke through the ice dams blocking glacial Lake Missoula during the Pleistocene. Soils are typically deep loess on hills and foothills. Potential natural vegetation is big sagebrush, bluebunch wheatgrass, Idaho fescue, and three-tip sagebrush.

303(d) listed waterbodies



Total Maximum Daily Loads

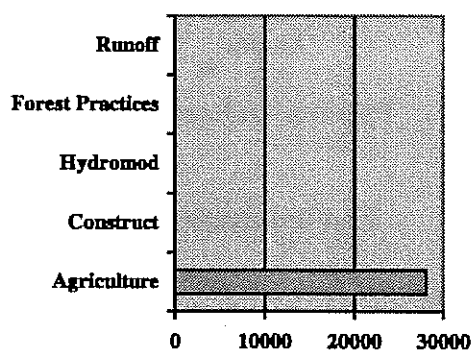
2 TMDLs required from the 1998 303(d) list

303(d) listed Problem Areas

Dissolved oxygen in Main Canal

High temperature in Main Canal

Lake Acres Impacted by Source



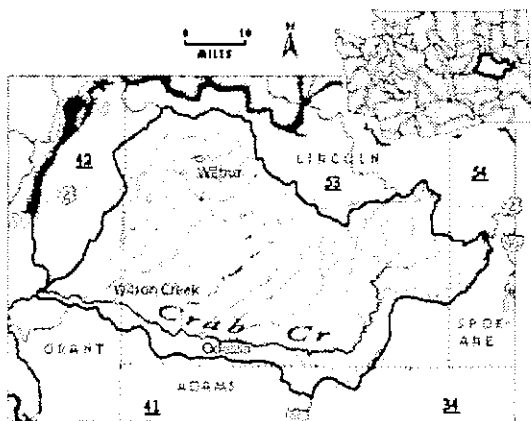
Unified Watershed Assessment Critical Environmental Information

Water	
Flow	Healthy
Quality	Impaired
TMDLs	Required
Public Health	
Shellfish	None
Drinking Water	Healthy
Nitrates	Impaired
Fish	Healthy

Water Quality Programs in WRIA #42

1. Assess nitrate leaching from irrigation, Upper Grant CD
2. Black Sands Water Quality Project, Upper Grant CD

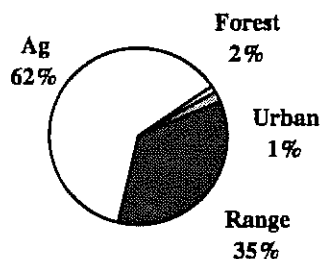
Upper Crab-Wilson Basin - WRIA #43



WRIA #43 encompasses about 1,185,282 acres of the Columbia Basin ecoregion. This large watershed receives only 10 inches of rainfall per year.

Demographics

Land use in the Upper Crab/Wilson



Land Base (in acres)

Federal	10,851	.9%
State	36,678	3.1%
Local	-0-	
Tribal	-0-	
Private	1,138,453	96.0%

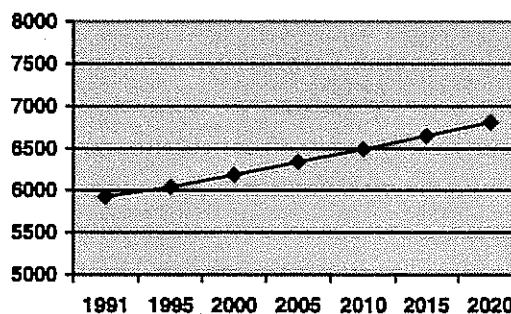
Principal Economic Activity (as total wages)

Agriculture/Forestry	11%
Retail Trade	14%
Services	14%
Government	43%
Other	18%

Population

There are approximately 6,043 people living in the Upper Crab-Wilson Basin. The primary population centers are Odessa and Medical Lake.

Projected population trends



Counties

Lincoln (88%)	Grant (8%)
Spokane (2%)	Adams (2%)

Special purpose districts

Conservation Districts: Lincoln County; Upper Grant; Spokane County; Adams

Principal Cities

Medical Lake	Odessa
Wilbur	Reardan
Harrington	Almira

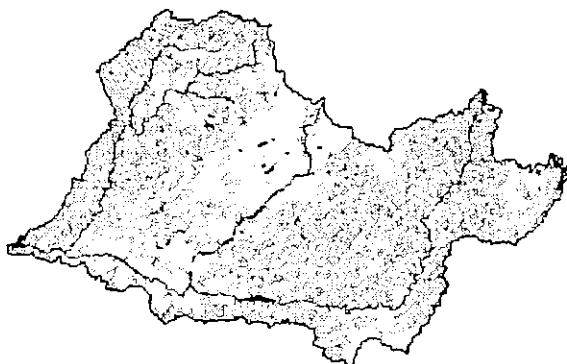
Reservation Lands

None

Environment

The scablands and loess islands were formed as immense floods periodically broke through the ice dams blocking glacial Lake Missoula during the Pleistocene. Soils are typically deep loess on hills and foothills. Potential natural vegetation is big sagebrush, bluebunch wheatgrass, Idaho fescue, and three-tip sagebrush.

303(d) listed waterbodies



Total Maximum Daily Loads

3 TMDLs required from the 1998 303(d) list

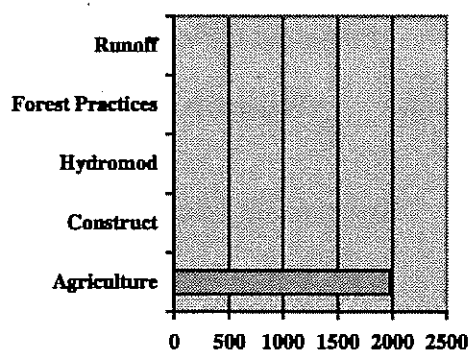
303(d) listed Problem Areas

Fecal coliform in Medical, West Lake

Nutrients in Medical, West Lake

pH in Crab Creek

Lake Acres Impacted by Source



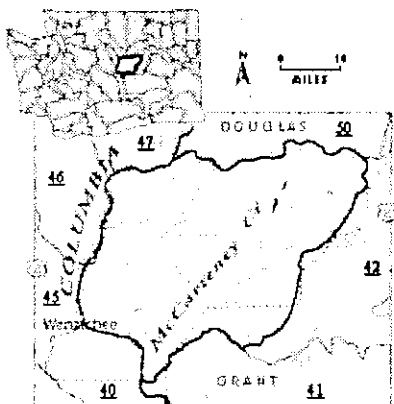
Unified Watershed Assessment Critical Environmental Information

Water	
Flow	Healthy
Quality	Impaired
TMDLs	Required
Public Health	
Shellfish	None
Drinking Water	Healthy
Nitrates	Impaired
Fish	Healthy

Water Quality Programs in WRIA #43

1. Onsite System Technical Assistance, Lincoln County Health
2. Residue Management Project, Lincoln CD
3. Groundwater Vulnerability to Pesticides and Fertilizers, Lincoln CD

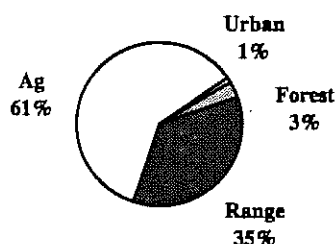
Moses Coulee Basin - WRIA #44



WRIA #44 encompasses nearly 730,029 acres and is located within the Columbia Basin ecoregion. This watershed receives only 7 inches of rainfall per year.

Demographics

Land use in the Moses Coulee Basin



Land Base (in acres)

Federal	31,123	4.3%
State	58,141	8.0%
Local	-0-	
Tribal	-0-	
Private	640,765	87.7%

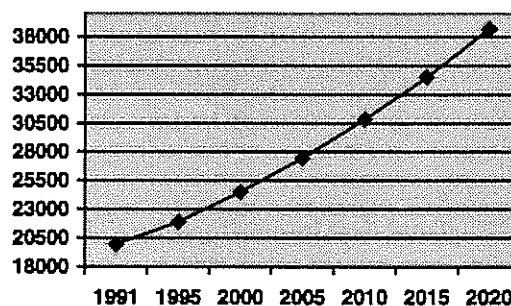
Principal Economic Activity (as total wages)

Agriculture	35%
Retail Trade	18%
Government	19%
Services	12%
Other	16%

Population

There are approximately 21,897 people living in the Moses Coulee Basin. The primary population centers are East Wenatchee and Waterville.

Projected population trends



Counties

Douglas (93%)
Grant (7%)

Special purpose districts

Conservation Districts: Foster Creek; Upper Grant; South Douglas

Irrigation Districts: Greater East Wenatchee; Palisades

Principal Cities

East Wenatchee Waterville
Rock Island

Reservation Lands

None

Environment

The scablands and loess islands were formed as immense floods periodically broke through the ice dams blocking glacial Lake Missoula during the Pleistocene. Soils are typically deep loess on hills and foothills. Potential natural vegetation is big

sagebrush, bluebunch wheatgrass, Idaho fescue, and three-tip sagebrush.

303(d) listed waterbodies



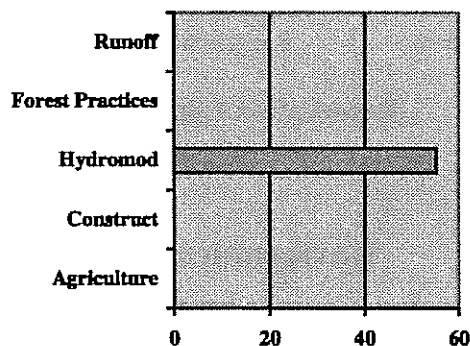
Total Maximum Daily Loads

0 TMDLs required from the 1998 303(d) list

303(d) listed Problem Areas

High temperature in the Columbia River

Stream Miles Impacted by Source



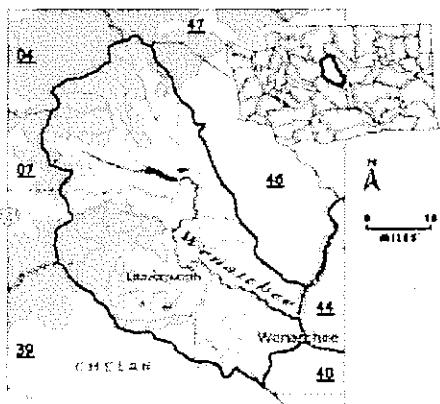
Unified Watershed Assessment Critical Environmental Information

Water	
Flow	Healthy
Quality	Impaired
TMDLs	None required
Public Health	
Shellfish	None
Drinking Water	Healthy
Nitrates	Impaired
Fish	Healthy

Water Quality Programs in WRIA #44

1. Watershed Planning under the Watershed Management Act (2514 WAC)
2. Instream flows of Columbia River under 173.563 WAC, Ecology
3. Douglas County Wellhead Protection Study, Douglas County
4. Water Quality Resource Library, Foster CD

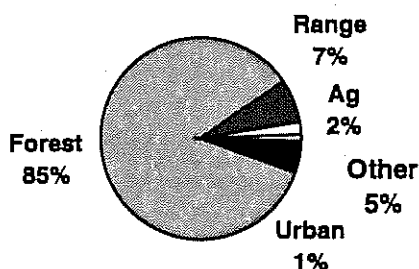
Wenatchee Basin - WRIA #45



WRIA #45 encompasses about 877,392 acres. This watershed is located within the Cascades and Columbia Basin ecoregions. Rainfall averages 56 inches per year.

Demographics

Land use in the Wenatchee Basin



Land Base (in acres)

Federal	689,481	78.6%
State	15,126	1.7%
Local	-0-	
Tribal	-0-	
Private	172,785	19.7%

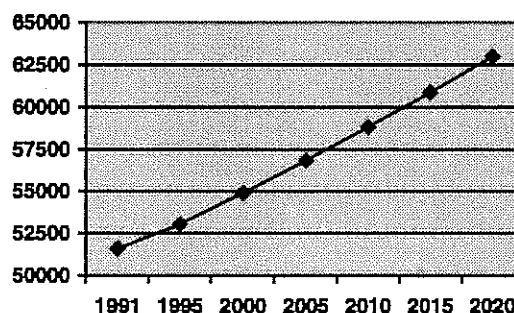
Principal Economic Activity (as total wages)

Agriculture	23%
Retail Trade	17%
Services	18%
Government	17%
Other	25%

Population

There are approximately 53,055 people living in the Wenatchee Basin. The primary population centers are Wenatchee, Cashmere, and Leavenworth.

Projected population trends



Counties

Chelan (100%)

Special purpose districts

Chelan County Conservation District

Irrigation Districts: Beehive; Icicle; Lower Squilchuck; Peshastin; Stemilt; Wenatchee Reclamation; Wenatchee Heights; Wenatchee-Chewawa; Lower Stemilt; Millerdale

Principal Cities

Wenatchee Cashmere
Leavenworth Peshastin

Reservation Lands

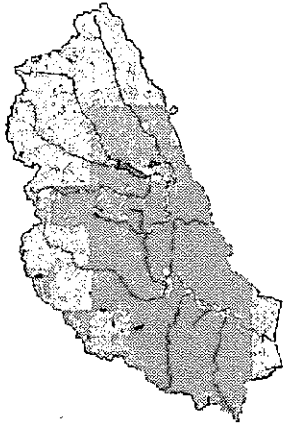
None

Environment

Steep, glaciated, mountains, ridges, and U-shaped valleys with high gradient streams and rivers. Typical soils include deep loams: silt loam, sandy loam, gravelly loam, and cindery sandy loam. Potential natural vegetation is ponderosa pine, Douglas fir, grand fir, and pine grass. Mean

temperature ranges from 16/32° (winter) to 48/78° (summer).

303(d) listed waterbodies



Total Maximum Daily Load

19 TMDLs required from the 1998 303(d) list

303(d) listed Problem Areas

Fecal coliform in Brender Creek, Chumstick Creek, and Mission Creek

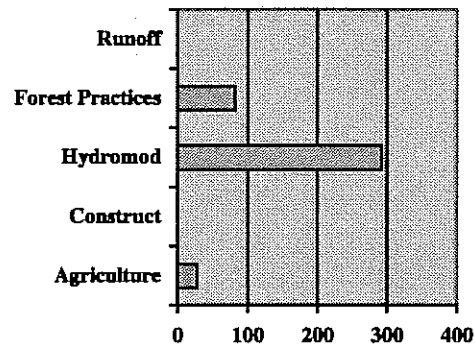
Dissolved oxygen in Brender Creek, Chumstick Creek, Icicle Creek, and Wenatchee River

Low instream flows in Chumstick Creek, Icicle Creek, Mission Creek, Peshastin Creek, and Wenatchee River

High temperature in Chiwaukum Creek, Icicle Creek, Little Wenatchee River, Mission Creek, Nason Creek, Peshastin Creek, and Wenatchee River

Pesticides in Mission Creek,

Stream Miles Impacted by Source



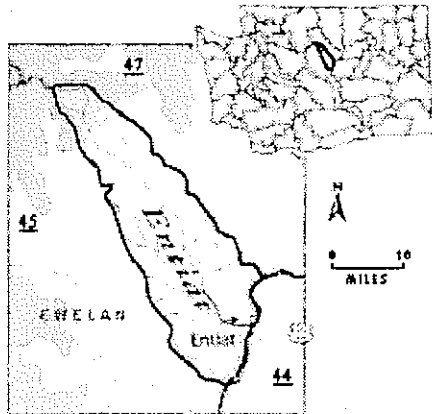
Unified Watershed Assessment Critical Environmental Information

Water	
Flow	Impaired
Quality	Healthy
TMDLs	Required
Public Health	
Shellfish	None
Drinking Water	Healthy
Nitrates	Healthy
Fish	Threatened

Water Quality Programs in WRIA #45

1. Wenatchee Watershed Ranking and Planning, Chelan CD
2. Wenatchee Watershed Plan Implementation, Chelan CD
3. Instream flows of Wenatchee Basin, Ecology
4. US Forest Service Northwest Forest Plan
5. Mission Creek Restoration Study, Chelan CD
6. Lake Wenatchee Ground Water Assessment, Chelan County PUD#1

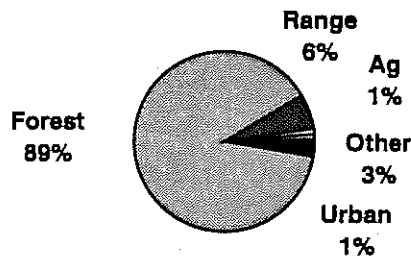
Entiat Basin - WRIA #46



WRIA #46 encompasses about 305,529 acres. This watershed is located within the Cascades and Columbia Basin ecoregions. It receives nearly 39 inches of rain per year.

Demographics

Land use in the Entiat



Land Base (in acres)

Federal	249,626	81.7%
State	15,294	5.0%
Local	-0-	
Tribal	-0-	
Private	40,609	13.3%

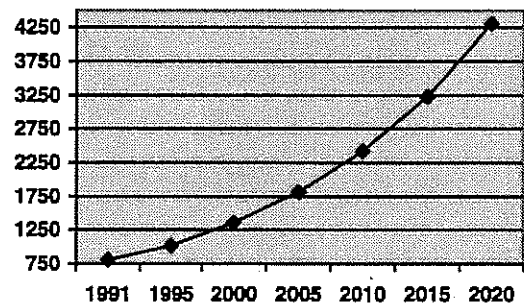
Principal Economic Activity (as total wages)

Agriculture	23%
Retail Trade	17%
Services	18%
Government	17%
Other	25%

Population

There are approximately 1,108 people living in the Entiat Basin. The primary population center is Entiat. The majority of people live in unincorporated areas.

Projected population trends



Counties

Chelan (100%)

Special purpose districts

Chelan County Conservation District

Entiat Irrigation District

Principal Cities

Entiat
Ardenvoir

Reservation Lands

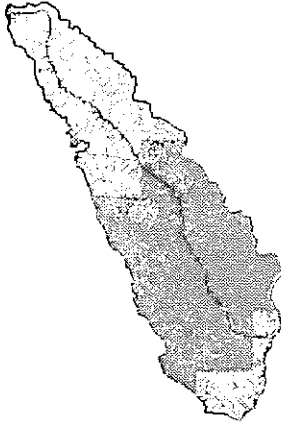
None

Environment

Steep, glaciated, mountains, ridges, and U-shaped valleys with high gradient streams and rivers. Typical soils include deep loams: silt loam, sandy loam, gravelly loam, and cindery sandy loam. Potential natural vegetation is ponderosa pine, Douglas fir, grand fir, and pine grass. Mean

temperature ranges from 16/32° (winter) to 48/78° (summer).

303(d) listed waterbodies



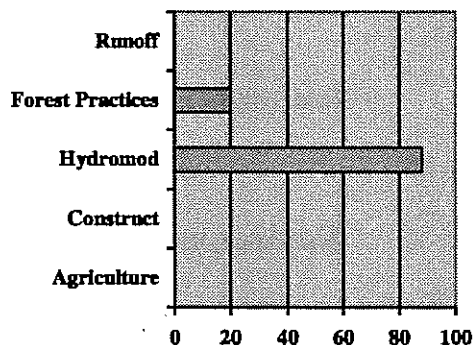
Total Maximum Daily Loads

0 TMDLs required from the 1998 303(d) list

303(d) listed Problem Areas

Low instream flows in the Entiat River

Stream Miles Impacted by Source



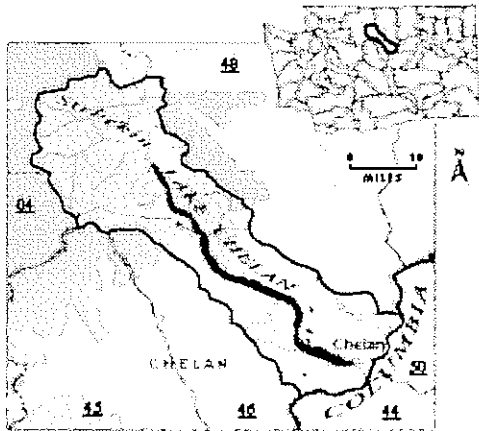
Unified Watershed Assessment Critical Environmental Information

Water	
Flow	Healthy
Quality	Healthy
TMDLs	None required
Public Health	
Shellfish	None
Drinking Water	Healthy
Nitrates	Healthy
Fish	Impaired

Water Quality Programs in WRIA #46

1. Instream flows of Columbia River under 173-563 WAC, Ecology
2. U.S. Forest Service Northwest Forest Plan
3. Entiat Valley Watershed Plan

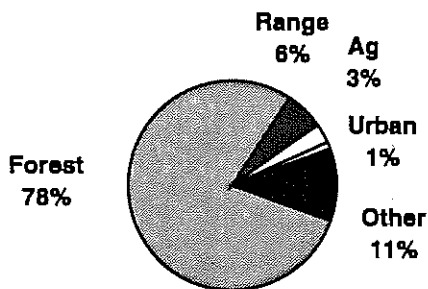
Chelan Basin - WRIA #47



WRIA #47 drains nearly 670,111 acres, including Lake Chelan. Located within the Cascades and Columbia Basin ecoregions, this watershed averages 52 inches of rain per year.

Demographics

Land use in the Chelan Basin



Land Base (in acres)

Federal	546,205	81.5%
State	13,180	2.0%
Local	-0-	
Tribal	-0-	
Private	110,726	16.5%

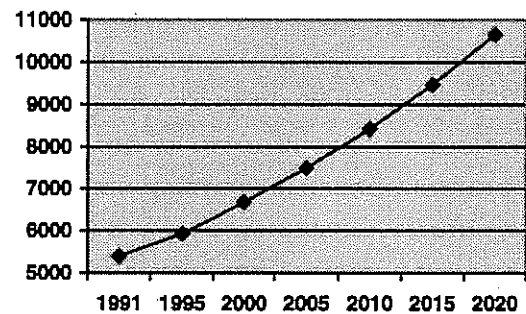
Principal Economic Activity (as total wages)

Agriculture	23%
Retail Trade	17%
Services	18%
Government	17%
Other	25%

Population

There are approximately 5,927 people living in the Chelan Basin. The primary population centers are Chelan and Manson. The majority of people live in unincorporated areas.

Projected population trends



Counties

Chelan (98%)
Okanogan (2%)

Special purpose districts

Conservation Districts: Chelan County; Okanogan

Irrigation Districts: Chelan River; Isenhardt; Lake Chelan Reclamation District; Chelan Falls

Principal Cities

Chelan Manson
Lucerne Holden
Stehekin

Reservation Lands

Wapato Pt.

Environment

Steep, glaciated, mountains, ridges, and U-shaped valleys with high gradient streams and rivers. Typical soils include deep loams: silt loam, sandy loam, gravelly loam, and cindery sandy loam. Potential natural vegetation is ponderosa pine, Douglas fir, grand fir, and pine grass. Mean

temperature ranges from 16/32° (winter) to 48/78° (summer).

303(d) listed waterbodies



Total Maximum Daily Loads

5 TMDLs required from the 1998 303(d) list

303(d) listed Problem Areas

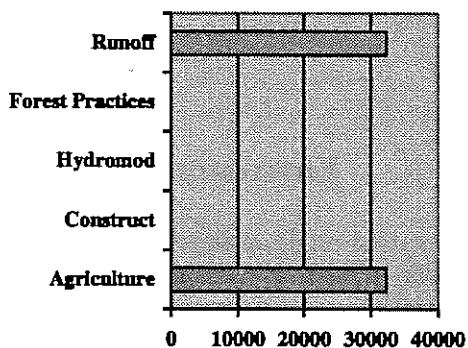
Pesticides in Lake Chelan and Lake Roses

PCBs in Lake Chelan

High temperature in Columbia River

Total dissolved gas in Columbia River

Lake Acres Impacted by Source



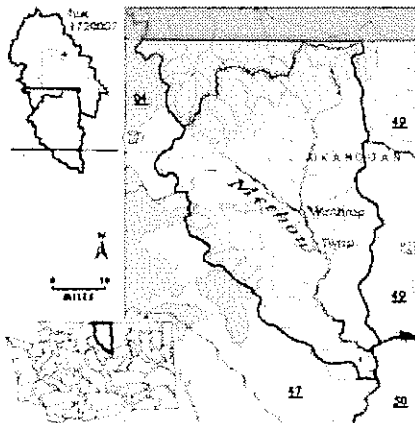
Unified Watershed Assessment Critical Environmental Information

Water	
Flow	Healthy
Quality	Healthy
TMDLs	In process
Public Health	
Shellfish	None
Drinking Water	Impaired
Nitrates	Healthy
Fish	Healthy

Water Quality Programs in WRIA #47

1. Lake Chelan Water Quality Plan, Chelan County PUD #1
2. Lake Chelan Phosphorus Monitoring
3. Instream flows for the Columbia River under 173-563 WAC
4. Lake Chelan Phosphorus TMDL
5. Lake Chelan Water Quality Management Committee
6. US Forest Service Northwest Forest Plan

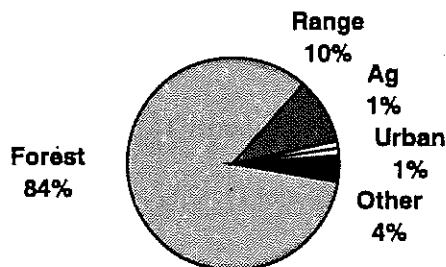
Methow Basin - WRIA #48



WRIA #48 encompasses nearly 1,357,656 acres in the Columbia Basin and Cascades ecoregion. This watershed receives about 31 inches of rainfall per year.

Demographics

Land use in the Methow Basin



Land Base (in acres)

Federal	1,163,948	85.7%
State	56,322	4.2%
Local	-0-	
Tribal	-0-	
Private	137,386	10.1%

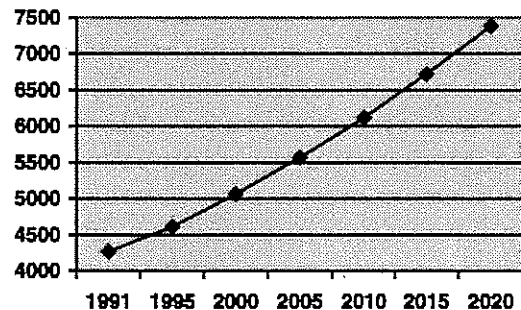
Principal Economic Activity (as total wages)

Agriculture/Forestry	30%
Retail Trade	16%
Services	15%
Government	21%
Other	18%

Population

There are approximately 4,608 people living in the Methow Basin. The primary population centers are Twisp and Winthrop.

Projected population trends



Counties

Okanogan (100%)

Special purpose districts

Conservation Districts: Okanogan

Irrigation Districts: Methow-Okanogan; Methow Valley; Pateros; Wolf Creek Reclamation

Principal Cities

Twisp	Pateros
Winthrop	Methow
Carlton	Mazama

Reservation Lands

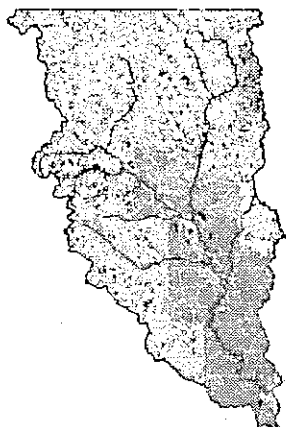
None

Environment

High, glaciated ridges, plateaus, and U-shaped valleys with numerous wetlands. Permanent and intermittent streams are high gradient. Soils are typically fine sandy loam to stony coarse sandy loam. Potential natural vegetation is shrub alpine meadow, mixed subalpine fir, with some Douglas

fir at lower elevations. Temperature ranges from 13/27° (winter) to 45/70° (summer).

303(d) listed waterbodies



Total Maximum Daily Loads

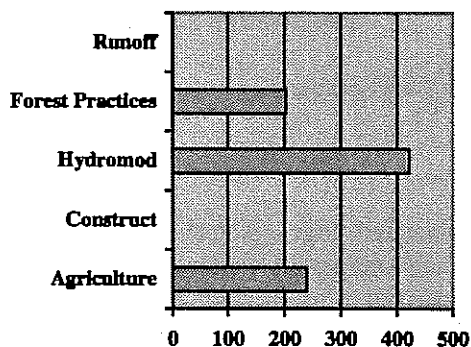
2 TMDLs required from the 1998 303(d) list

303(d) listed Problem Areas

Low instream flows in Beaver Creek, Chewack River, Early Winters Creek, Methow River, Twisp River, and Wolf Creek

High temperature in Methow River and Twisp River

Stream Miles Impacted by Source



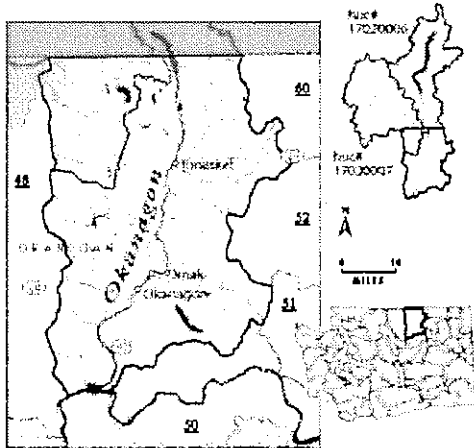
Unified Watershed Assessment Critical Environmental Information

Water	
Flow	Threatened
Quality	Healthy
TMDLs	Required
Public Health	
Shellfish	None
Drinking Water	Healthy
Nitrates	Healthy
Fish	Threatened

Water Quality Programs in WRIA #48

1. Facility plan for the Mazama core and upper Methow area
2. Methow Groundwater Management Area, Okanogan County
3. 2514 Watershed Planning
4. Multi-objective River Corridor Plan for Methow Basin
5. Twisp River Watershed Analysis, USFS
6. Libby Watershed Analysis, USFS
7. Middle Methow Watershed Analysis, USFS
8. Early Winters Creek Watershed Analysis, USFS
9. Lost River and Robinson Creek Watershed Analysis, USFS
10. Chewack River Watershed Analysis, USFS
11. Okanogan County Septic Education Project, Okanogan County Health

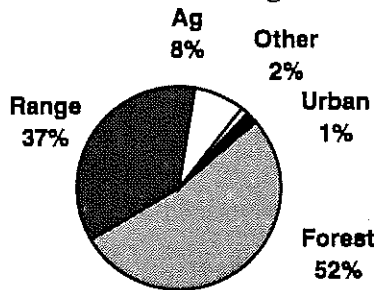
Okanogan Basin - WRIA #49



WRIA #49 drains about 1,344,550 acres. This watershed is within the Columbia Basin, Cascades, and Northern Rockies. Average rainfall is 15 inches per year.

Demographics

Land use in the Okanogan Basin



Land Base (in acres)

Federal	232,252	17.3%
State	273,374	20.3%
Local	-0-	
Tribal	279,506	20.8%
Private	559,418	41.6%

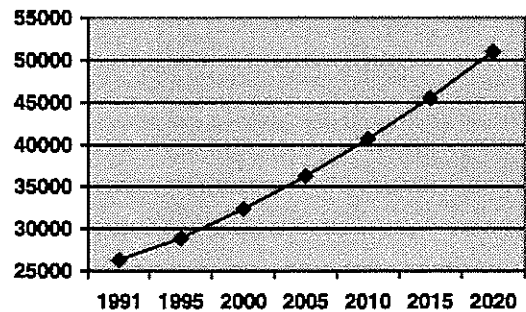
Principal Economic Activity (as total wages)

Agriculture/Forestry	30%
Retail Trade	16%
Services	15%
Government	21%
Other	18%

Population

There are approximately 28,855 people living in the Okanogan Basin. The primary population centers are Omak and Okanogan. The majority of people live in unincorporated areas.

Projected population trends



Counties

Okanogan (100%)

Special purpose districts

Conservation Districts: Okanogan

Irrigation Districts: Aenas Lake; Alta Vista; Helensdale Reclamation; Methow-Okanogan; Okanogan; Oroville-Tonasket; and Whitestone Reclamation

Principal Cities

Omak Okanogan
Brewster Oroville

Reservation Lands

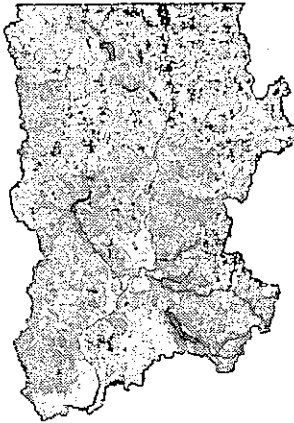
Colville Confederated Tribes

Environment

High, glaciated ridges, plateaus, and U-shaped valleys with numerous wetlands. Permanent and intermittent streams are high gradient. Soils are typically fine sandy loam to stony coarse sandy loam. Potential natural vegetation is shrub alpine meadow, mixed subalpine fir, with some Douglas

fir at lower elevations. Temperature ranges from 13/27° (winter) to 45/70° (summer).

303(d) listed waterbodies



Total Maximum Daily Loads

8 TMDLs required from the 1998 303(d) list

303(d) listed Problem Areas

Pesticides in Ninemile Creek, Okanogan River, Osoyoos Lake, and Tallant Creek

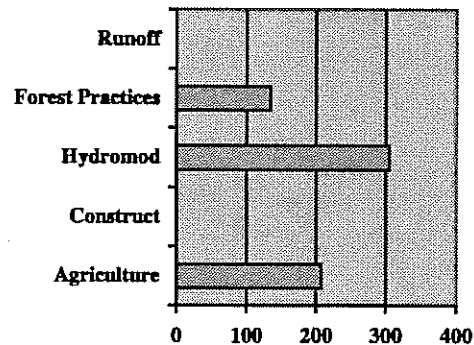
Fecal coliform in Okanogan River

High temperatures in Okanogan River and Similkameen River

Low instream flows in Salmon Creek

Metals in Similkameen River

Stream Miles Impacted by Source



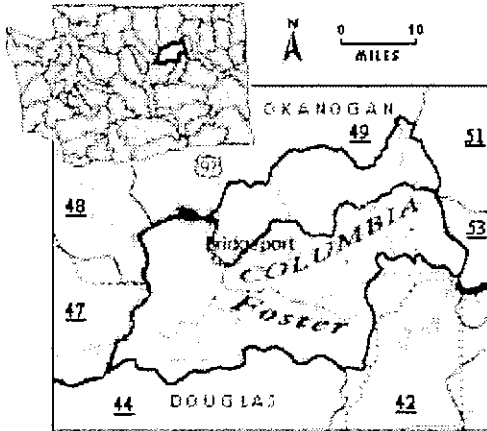
Unified Watershed Assessment Critical Environmental Information

Water	
Flow	Threatened
Quality	Threatened
TMDLs	Required
Public Health	
Shellfish	None
Drinking Water	Healthy
Nitrates	Healthy
Fish	Healthy

Water Quality Programs in WRIA #49

1. Okanogan River Water Quality Management Plan, Okanogan County
2. Salmon Creek Fish Enhancement
3. Omak Creek Planning Report, 1994
4. Tonasket Creek Watershed Assessment, USFS
5. Bonaparte Creek Watershed Assessment, USFS
6. Okanogan County Septic Education, Okanogan County Health

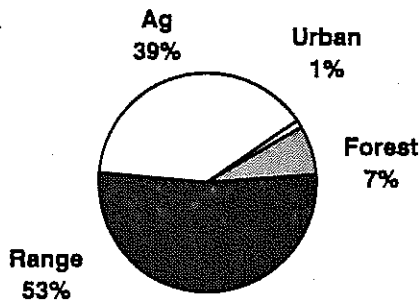
Foster Basin - WRIA #50



WRIA #50 encompasses about 578,182 acres. Located within the Columbia Basin and Northern Rockies ecoregion, this watershed receives 10 inches of rain a year.

Demographics

Land use in the Foster Basin



Land Base (in acres)

Federal	10,410	1.8%
State	60,136	10.4%
Local	-0-	
Tribal	152,382	26.4%
Private	355,254	61.4%

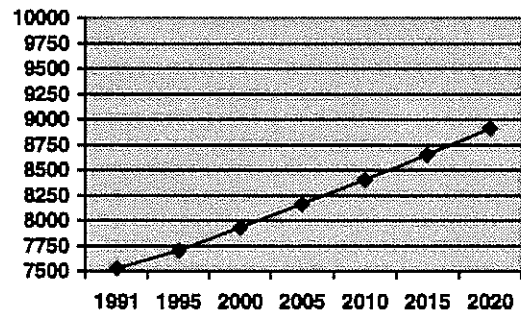
Principal Economic Activity (as total wages)

Agriculture	35%
Retail Trade	18%
Government	19%
Services	12%
Other	16%

Population

There are approximately 7,703 people living in the Foster Basin. The primary population centers are Bridgeport and Mansfield.

Projected population trends



Counties

Douglas (74%)
Okanogan (26%)

Special purpose districts

Conservation Districts: Okanogan; Foster Creek

Irrigation Districts: Bridgeport #1; Bridgeport Bar; Brewster Flat; Pateros

Principal Cities

Bridgeport
Mansfield

Reservation Lands

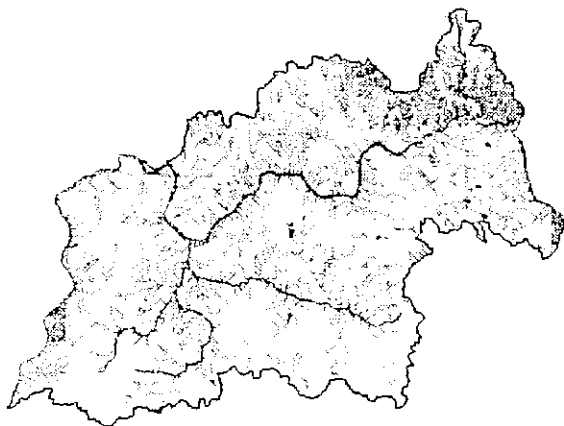
Colville Confederated Tribes

Environment

This valley was impacted by the melting of the Okanogan lobe of the Wisconsin Glacier. As the glacier melted, it retreated up the valley leaving behind a blanket of glacial till. Up to 50 feet

thick, the till is composed of clay, silt, sand, gravel, cobbles, and boulders. This soil supports native vegetation composed of big sagebrush, bluebunch wheatgrass, three-tip sage, and Idaho fescue.

303(d) listed waterbodies



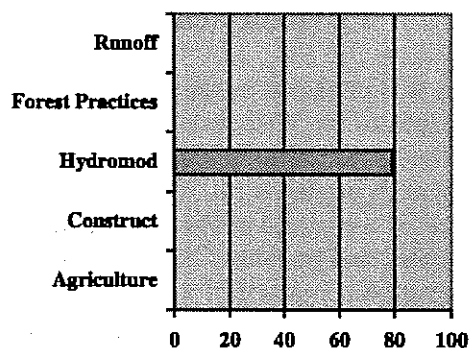
Total Maximum Daily Loads

2 TMDLs required from the 1998 303(d) list

303(d) listed Problem Areas

Total dissolved gas in the Columbia River

Stream Miles Impacted by Source



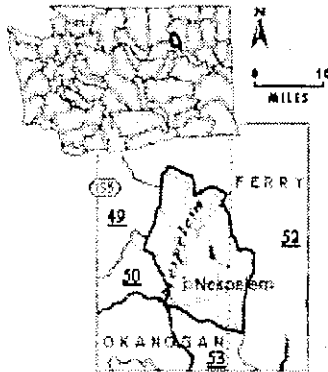
Unified Watershed Assessment Critical Environmental Information

Water	
Flow	Healthy
Quality	Threatened
TMDLs	Required
Public Health	
Shellfish	None
Drinking Water	Healthy
Nitrates	Impaired
Fish	Healthy

Water Quality Programs in WRIA #50

1. Water Quality Resource Library, Foster CD
2. Watershed Planning under 2514 WAC
3. Wellhead Protection Phase 1 Study, Douglas County
4. East Foster Creek Water Quality Project, Foster CD

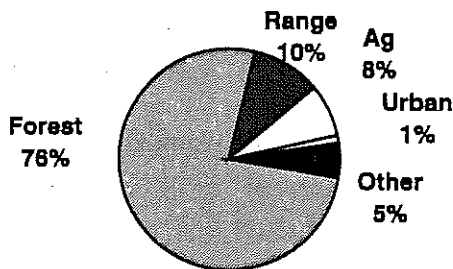
Nespelem Basin - WRIA #51



WRIA #51 encompasses about 144,643 acres. This watershed is located within the Columbia Basin and Northern Rockies ecoregions. Average rainfall is 10 inches per year,

Demographics

Land use in the Nespelem Basin



Land Base (in acres)

Federal	-0-	
State	-0-	
Local	-0-	
Tribal	144,542	99.9%
Private	101	.1%

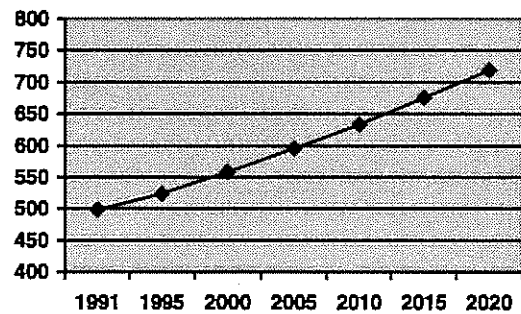
Principal Economic Activity (as total wages)

Agriculture/Forestry	30%
Retail	16%
Services	15%
Government	21%
Other	18%

Population

There are approximately 524 people living in the Nespelem Basin. The primary population center is Nespelem. The majority of people live in unincorporated areas.

Projected population trends



Counties

Okanogan (85%)
Ferry (15%)

Special purpose districts

Conservation Districts: Okanogan; Ferry

Principal Cities

Nespelem
Colville Indian Agency

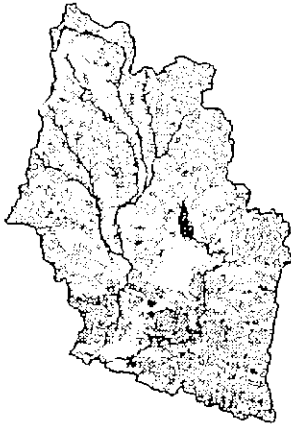
Reservation Lands

Colville Confederated Tribes

Environment

This valley was impacted by the melting of the Okanogan lobe of the Wisconsin Glacier. As the glacier melted, it retreated up the valley leaving behind a blanket of glacial till. Up to 50 feet thick, the till is composed of clay, silt, sand, gravel, cobbles, and boulders. This soil supports native vegetation composed of big sagebrush, bluebunch wheatgrass, three-tip sage, and Idaho fescue.

303(d) listed waterbodies



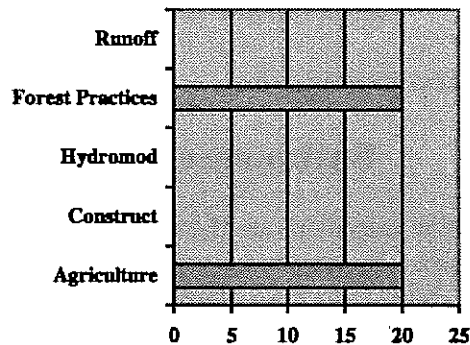
Total Maximum Daily Loads

0 TMDLs required from the 1998 303(d) list

303(d) listed Problem Areas

none

Stream Miles Impacted by Source



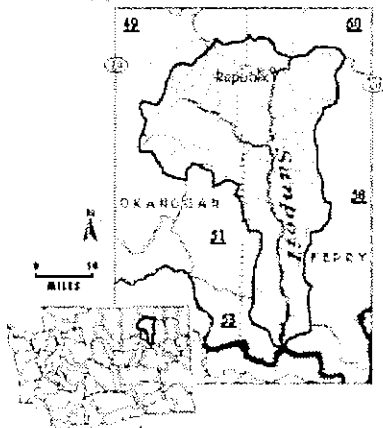
Unified Watershed Assessment Critical Environmental Information

Water	
Flow	Healthy
Quality	Impaired
TMDLs	None required
Public Health	
Shellfish	None
Drinking Water	Healthy
Nitrates	Healthy
Fish	Healthy

Water Quality Programs in WRIA #51

None

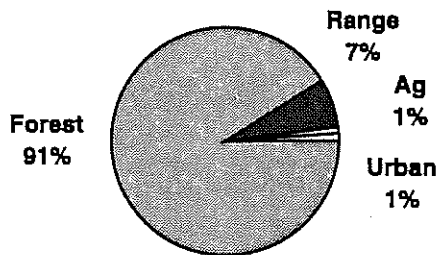
Sanpoil Basin - WRIA #52



WRIA #52 encompasses about 628,128 acres. It is located within the Northern Rockies and Columbia Basin ecoregions. This watershed receives nearly 16 inches of rainfall per year.

Demographics

Land use in the Sanpoil Basin



Land Base (in acres)

Federal	185,652	29.6%
State	15,450	2.5%
Local	-0-	
Tribal	332,476	52.9%
Private	94,550	15.0%

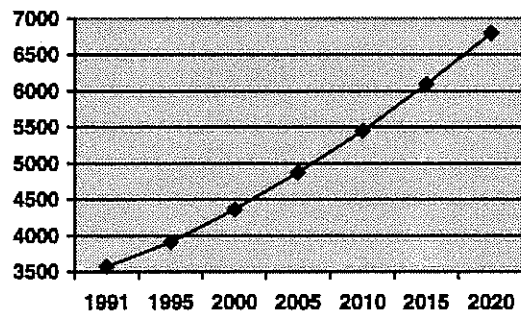
Principal Economic Activity (as total wages)

Manufacturing	12%
Retail Trade	13%
Services	14%
Government	39%
Agriculture/Forestry	3%

Population

There are approximately 3,904 people living in the Sanpoil Basin. The primary population center is Republic. The majority of people live in unincorporated areas.

Projected population trends



Counties

Ferry (67%)
Okanogan (33%)

Special purpose districts

Conservation Districts: Ferry; Okanogan

Principal Cities

Republic
Keller

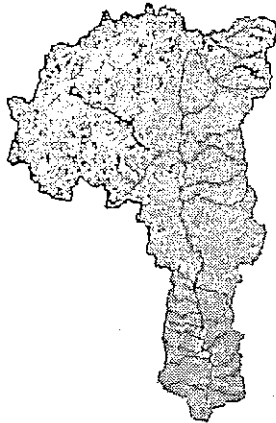
Reservation Lands

Colville Confederated Tribes

Environment

Rugged, high mountains are the dominant feature of this region. Elevations are generally 1,300 to 8,000 feet. Mountains have sharply-crested ridges and steep slopes cut by steep walled narrow stream valleys. Soils are derived from acidic rock. Potential natural vegetation includes western white pine, lodgepole pine, western red cedar, Douglas fir, wheatgrass, fescue, and needlegrass.

303(d) listed waterbodies



Total Maximum Daily Loads

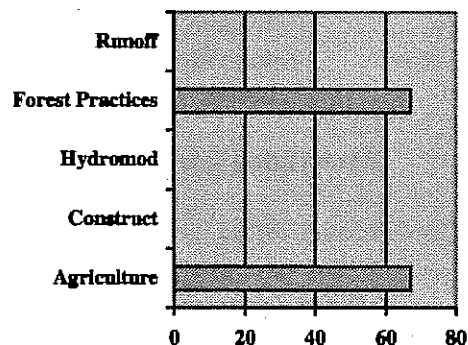
2 TMDLs required from the 1998 303(d) list

303(d) listed Problem Areas

Dissolved oxygen in Granite Creek and Sanpoil River

pH in O'Brien Creek

Stream Miles Impacted by Source



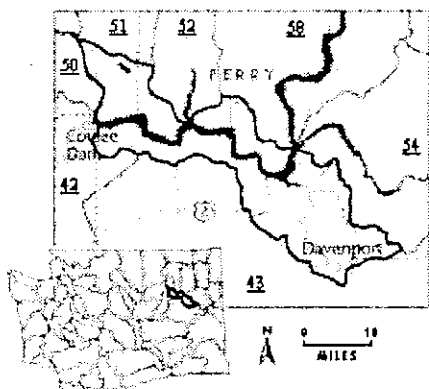
Unified Watershed Assessment Critical Environmental Information

Water	
Flow	Healthy
Quality	Threatened
TMDLs	Required
Public Health	
Shellfish	None
Drinking Water	Healthy
Nitrates	Healthy
Fish	Healthy

Water Quality Programs in WRIA #52

1. Ferry Lakes Invaders Project, Ferry CD
2. Sanpoil Basin Hydrogeology Study, City of Republic

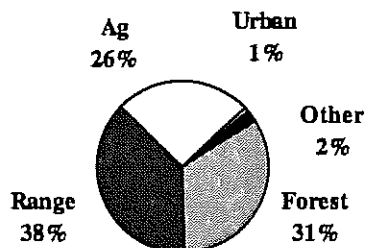
Lower Lake Roosevelt Basin - WRIA #53



WRIA #53 encompasses about 326,198 acres. This watershed is part of the Columbia Basin and Northern Rockies ecoregions. Average annual rainfall is 11 inches.

Demographics

Land use in the Lower Lake Roosevelt



Land Base (in acres)

Federal	8,781	2.7%
State	9,525	2.9%
Local	-0-	
Tribal	114,800	35.2%
Private	193,092	59.2%

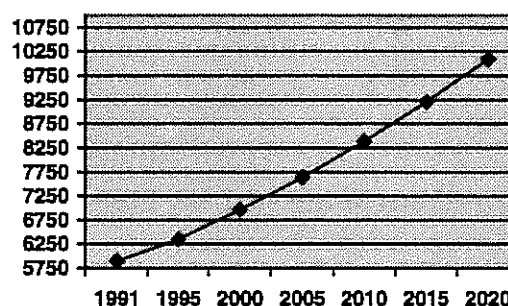
Principal Economic Activity (as total wages)

Agriculture/Forestry	11%
Retail Trade	14%
Services	14%
Government	43%
Other	18%

Population

There are approximately 6,348 people living in the Lower Lake Roosevelt Basin. The primary population centers are Davenport and Coulee Dam. The majority of people live in unincorporated areas.

Projected population trends



Counties

Lincoln (63%)	Ferry (23%)
Okanogan (14%)	Grant (<1%)

Special purpose districts

Conservation Districts: Lincoln; Ferry; Okanogan

Principal Cities

Davenport	Coulee Dam
Elmer City	Belvedere
Seatons Grove	Kootzville
Lone Pine	Lincoln

Reservation Lands

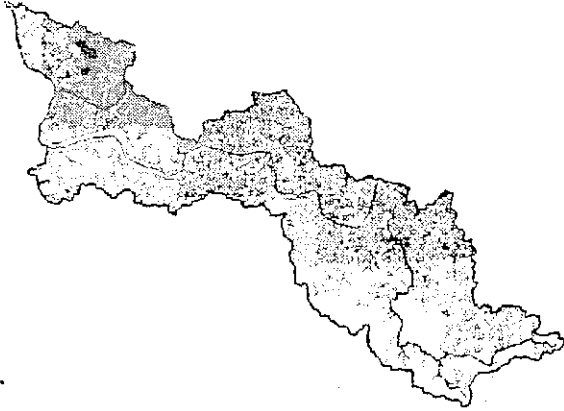
Colville Confederated Tribes

Environment

The scablands and loess islands were formed as immense floods periodically broke through the ice dams blocking glacial Lake Missoula during the Pleistocene. Soils are typically deep loess on hills and foothills. Potential natural vegetation is big

sagebrush, bluebunch wheatgrass, Idaho fescue, and three-tip sagebrush.

303(d) listed waterbodies



Total Maximum Daily Loads

5 TMDLs required from the 1998 303(d) list

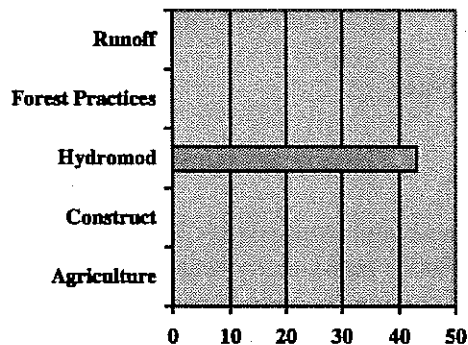
303(d) listed Problem Areas

Total dissolved gas in the Columbia River

Sediment bioassay in Franklin D. Roosevelt Lake

High temperature in Franklin D. Roosevelt Lake

Stream Miles Impacted by Source



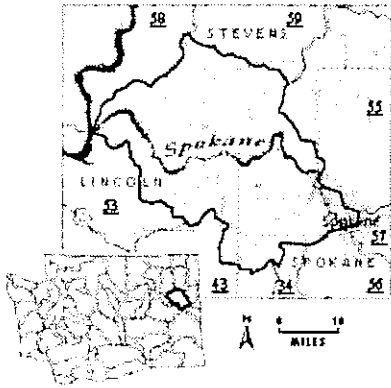
Unified Watershed Assessment Critical Environmental Information

Water	
Flow	Healthy
Quality	Impaired
TMDLs	Required
Public Health	
Shellfish	None
Drinking Water	Healthy
Nitrates	Impaired
Fish	Healthy

Water Quality Programs in WRIA #53

1. Transboundary Gas Group working on dissolved gas in Columbia River system
2. Ground Water Vulnerability Study, Lincoln CD
3. Agricultural BMP Education Project, Lincoln CD
4. On-site System Technical Assistance, Lincoln County Health

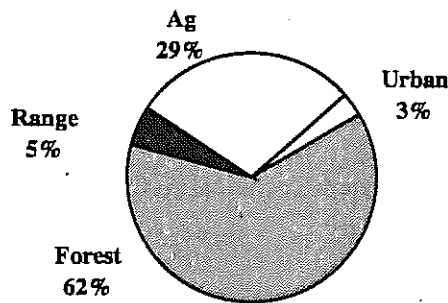
Lower Spokane Basin - WRIA #54



WRIA #54 encompasses about 568,799 acres. This watershed is located within the Northern Rockies and Columbia Basin ecoregion. Average annual rainfall is 14 inches per year.

Demographics

Land use in the Lower Spokane



Land Base (in acres)

Federal	8,061	1.5%
State	37,205	6.5%
Local	671	.1%
Tribal	142,910	25.1%
Private	379,952	66.8%

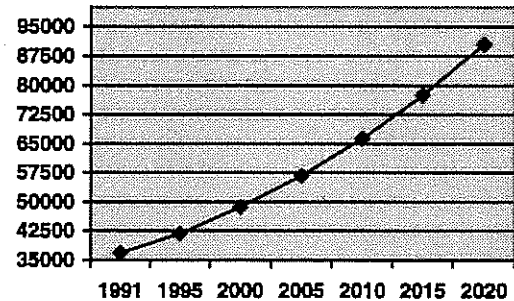
Principal Economic Activity (as total wages)

Agriculture/Forestry	1%
Manufacturing	14%
Retail Trade	18%
Services	27%
Government	19%
Other	21%

Population

There are approximately 41,670 people living in the Lower Spokane Basin. The primary population centers are Spokane and Medical Lake. The majority of people live in unincorporated areas.

Projected population trends



Counties

Stevens (49%)	Spokane (28%)
Lincoln (23%)	

Special purpose districts

Conservation Districts: Stevens County; Spokane County; Lincoln County

Principal Cities

Spokane	Medical Lake
Airway Heights	Wellpinit
Ford	Reardon

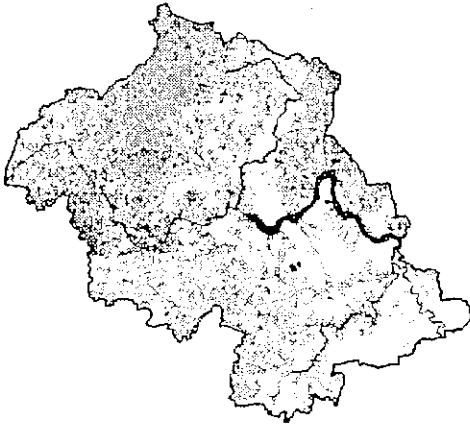
Reservation Lands

Spokane Tribe

Environment

The scablands and loess islands were formed as immense floods periodically broke through the ice dams blocking glacial Lake Missoula during the Pleistocene. Soils are typically deep loess on hills and foothills. Potential natural vegetation is big sagebrush, bluebunch wheatgrass, Idaho fescue, and three-tip sagebrush.

303(d) listed waterbodies



Total Maximum Daily Loads

29 TMDLs required from the 1998 303(d) list

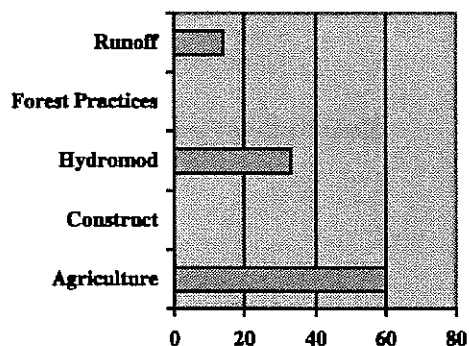
303(d) listed Problem Areas

High temperatures in Chamokane Creek and Spokane River

PCBs in Long Lake and Spokane River

Metals in Spokane River

Stream Miles Impacted by Source



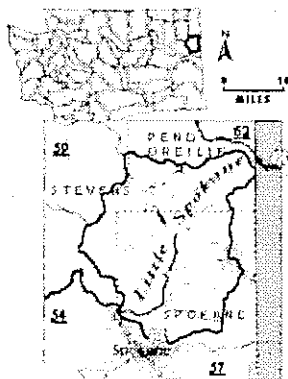
Unified Watershed Assessment Critical Environmental Information

Water	
Flow	Healthy
Quality	Impaired
TMDLs	In process
Public Health	
Shellfish	None
Drinking Water	Healthy
Nitrates	Impaired
Fish	Healthy

Water Quality Programs in WRIA #54

1. Chamokane Creek Watershed Plan, Spokane County CD
2. Stormwater Management Plan and Implementation, City of Spokane
3. Spokane-Rathdrum Prairie Aquifer Protection, City of Spokane
4. Water Quality Education and Public Involvement, Spokane County
5. Sustainable Landscaping Project, Spokane County
6. Lake Spokane Phase 1 Restoration, Spokane CD
7. On-site System Education, Spokane Health

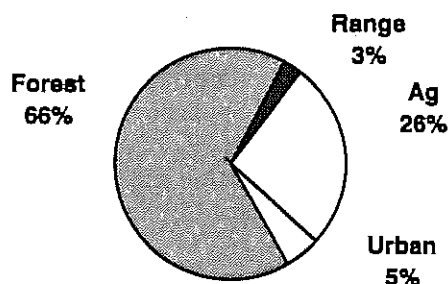
Little Spokane Basin - WRIA #55



WRIA #55 encompasses about 431,826 acres within the Northern Cascades and Columbia Basin ecoregions. This watershed averages 21 inches of rainfall per year.

Demographics

Land use in the Little Spokane



Land Base (in acres)

Federal	2,442	.6%
State	20,102	4.7%
Local	1,449	.3%
Tribal	-0-	
Private	407,833	94.4%

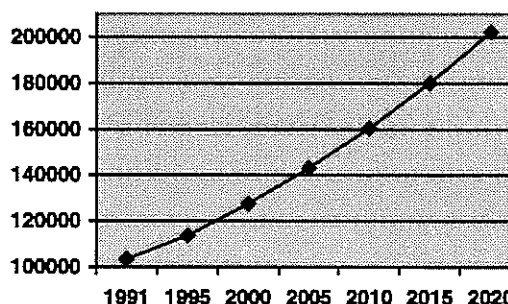
Principal Economic Activity (as total wages)

Manufacturing	14%
Retail Trade	18%
Services	27%
Government	19%
Other	22%

Population

There are approximately 113,575 people living in the Little Spokane Basin. The primary population centers are Deer Park and Mead. The majority of people live in unincorporated areas.

Projected population trends



Counties

Spokane (62%) Pend Oreille (25%)
Stevens (13%)

Special purpose districts

Conservation Districts: Spokane County; Pend Oreille; Stevens County

Irrigation Districts: North Spokane #8

Principal Cities

Deer Park Mead
Colbert Clayton
Elk Chatteroy

Reservation Lands

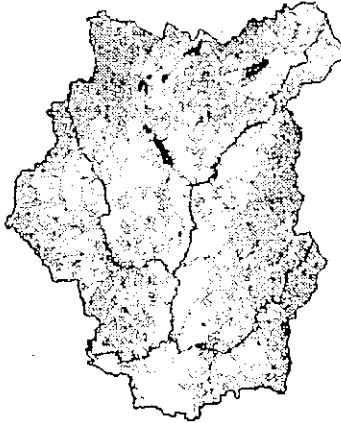
None

Environment

High mountains are the dominant feature of this region. Elevations range from 1,300 to 6,000 feet. Mountains have sharply-crested ridges and steep slopes cut by steep walled narrow stream valleys. Soils are derived from basic rock. Potential natural vegetation includes western white pine,

lodgepole pine, western red cedar, Douglas fir, wheatgrass, fescue, and needlegrass.

303(d) listed waterbodies



Total Maximum Daily Loads

14 TMDLs required from the 1998 303(d) list

303(d) listed Problem Areas

High temperature in Deadman Creek and Little Spokane River

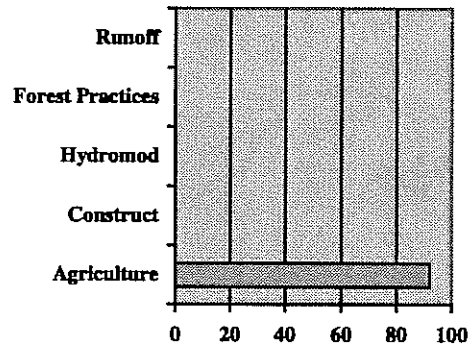
Dissolved oxygen in Dragoon Creek

Fecal coliform in Little Spokane River and Dragoon Creek

PCBs in Little Spokane River

Low instream flows for the Little Spokane River

Stream Miles Impacted by Source



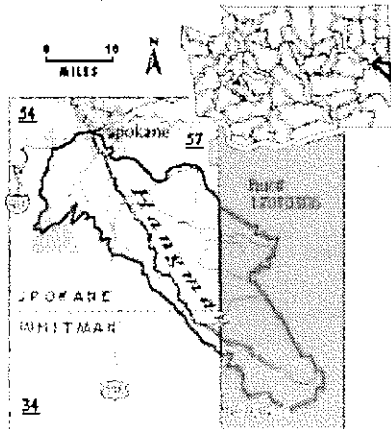
Unified Watershed Assessment Critical Environmental Information

Water	
Flow	Healthy
Quality	Impaired
TMDLs	In process
Public Health	
Shellfish	None
Drinking Water	Healthy
Nitrates	Impaired
Fish	Healthy

Water Quality Programs in WRIA #55

1. Instream flows set in accordance with 173-555 WAC, Ecology
2. Watershed assessment completed in 1995
3. Dragoon Creek Watershed Plan, Spokane CD
4. Wellhead Protection Program, Phase 1, City of Spokane
5. Spokane-Rathdrum Prairie Aquifer Protection, City of Spokane
6. Deer Park Ground Water Management Area, Spokane County Public Works
7. Eloika Lake Watershed Management Plan, Spokane County CD
8. On-site System Education, Spokane County Health

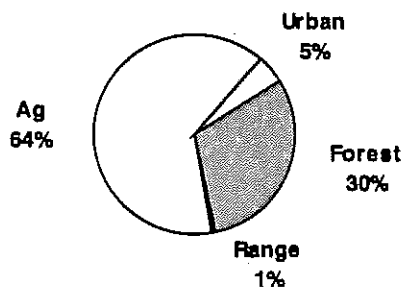
Hangman Basin - WRIA #56



WRIA #56 encompasses about 289,833 acres. Located within the Columbia Basin ecoregion, this watershed receives an average annual rainfall of 18 inches.

Demographics

Land use in the Hangman Basin



Land Base (in acres)

Federal	1,921	.7%
State	2,995	1.0%
Local	721	.3%
Tribal	-0-	
Private	284,196	98.0%

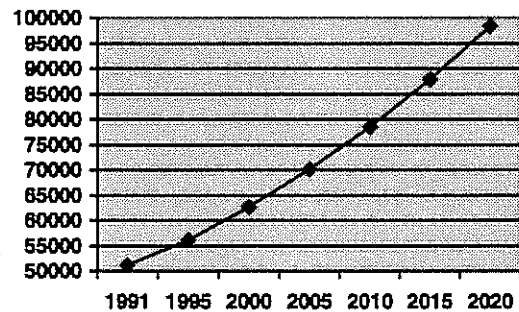
Principal Economic Activity (as total wages)

Manufacturing	12%
Retail Trade	20%
Services	29%
Government	16%
Other	23%

Population

There are approximately 56,035 people living in the Hangman Basin. The primary population centers are Spokane and Cheney. The majority of people live in unincorporated areas.

Projected population trends



Counties

Spokane (95%)
Whitman (5%)

Special purpose districts

Conservation Districts: Spokane County; Pine Creek

Principal Cities

Spokane Cheney
Tekoa Rockford
Fairfield Spangle

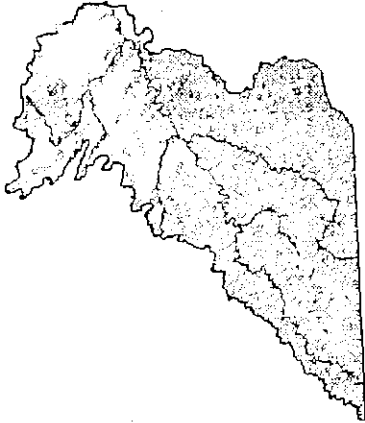
Reservation Lands

None

Environment

This basin was impacted by the immense floods from glacial Lake Missoula that periodically broke through the ice dam. The floods scoured the loess covering the plateau. Potential natural vegetation on these loess islands include big sagebrush, three-tip, bluebunch wheatgrass and Idaho fescue.

303(d) listed waterbodies



Total Maximum Daily Loads

7 TMDLs required from the 1998 303(d) list

303(d) listed Problem Areas

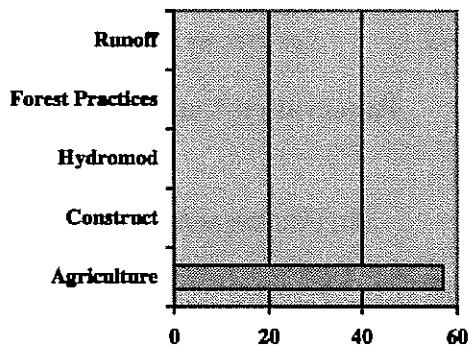
Dissolved oxygen in Hangman Creek

Fecal coliform in Hangman Creek

pH in Hangman Creek

High temperature in Hangman Creek

Stream Miles Impacted by Source



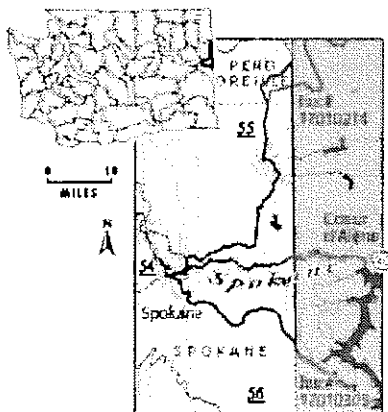
Unified Watershed Assessment Critical Environmental Information

Water	
Flow	Healthy
Quality	Impaired
TMDLs	In process
Public Health	
Shellfish	None
Drinking Water	Healthy
Nitrates	Impaired
Fish	Healthy

Water Quality Programs in WRIA #56

1. Hangman Creek Flood Hazard Management Plan
2. Hangman Creek Watershed Plan, Spokane CD
3. Hangman Creek Watershed Implementation, Spokane CD
4. Spokane-Rathdrum Prairie Aquifer Protection, City of Spokane
5. Water Quality Public Education and Involvement, Spokane County
6. On-site System Education, Spokane County Health

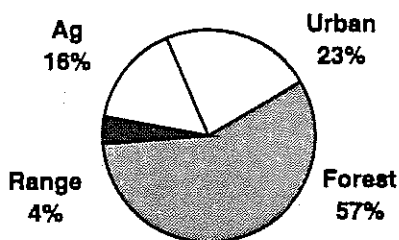
Middle Spokane Basin - WRIA #57



WRIA #57 encompasses about 183,274 acres. This small watershed is located within the Columbia Basin and Northern Rockies ecoregions. Average annual rainfall is 22 inches per year.

Demographics

Land use in the Middle Spokane Basin



Land Base (in acres)

Federal	-0-	-0-
State	12,247	6.7%
Local	3,621	2.0%
Tribal	-0-	-0-
Private	167,406	91.3%

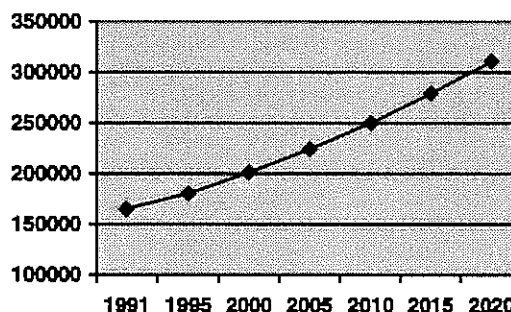
Principal Economic Activity (as total wages)

Manufacturing	12%
Retail Trade	20%
Services	29%
Government	16%
Other	23%

Population

There are approximately 180,526 people living in the Middle Spokane Basin. The primary population center is Spokane.

Projected population trends



Counties

Spokane (93%)
Pend Oreille (7%)

Special purpose districts

Conservation Districts: Spokane County; Pend Oreille

Irrigation Districts: Carnhope #7; Consolidated #19; Hutchinson #16; Moab #20; Model #8; Orchard Ave. #6; Pasadena Park #17; Trentwood #3; Vera #15

Principal Cities

Spokane	Millwood
Trentwood	Chester
Opportunity	Greenacres

Reservation Lands

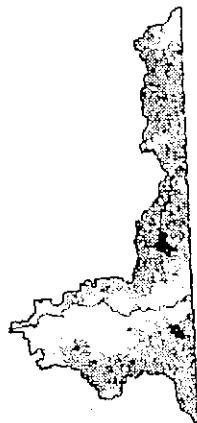
None

Environment

This basin was impacted by the immense floods from glacial Lake Missoula that periodically broke through the ice dam. The floods scoured the loess covering the plateau. Potential natural vegetation on these loess islands include big

sagebrush, three-tip, bluebunch wheatgrass and Idaho fescue.

303(d) listed waterbodies



Total Maximum Daily Loads

22 TMDLs required from the 1998 303(d) list

303(d) listed Problem Areas

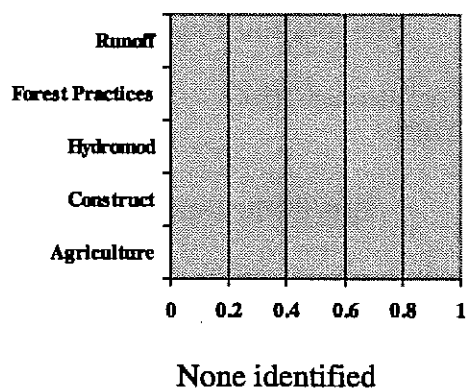
Nutrients in Newman Lake

Metals in Spokane River

Dissolved oxygen in Spokane River

PCBs in Spokane River

Stream Miles Impacted by Source



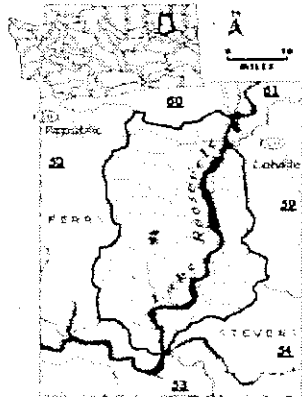
Unified Watershed Assessment Critical Environmental Information

Water	
Flow	Healthy
Quality	Impaired
TMDLs	In process
Public Health	
Shellfish	None
Drinking Water	Healthy
Nitrates	Healthy
Fish	Healthy

Water Quality Programs in WRIA #57

1. Spokane-Rathdrum Prairie Aquifer Protection, Spokane County
2. Septic Tank Elimination Project, City of Spokane
3. Spokane River Phosphorus Management Plan
4. Spokane Clean Water Appreciation Program, Spokane County
5. U.S. Geologic Survey NAWQA study of the basin, USGS

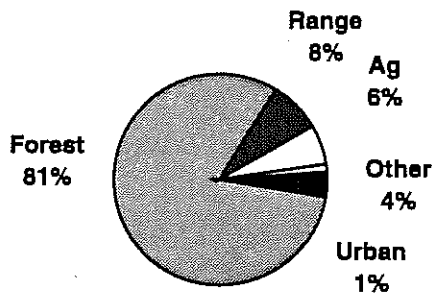
Middle Lake Roosevelt Basin - WRIA #58



WRIA #58 encompasses about 702,800 acres of Northern Rockies and Columbia Basin ecoregions. This watershed receives an average annual rainfall of 18 inches per year.

Demographics

Land use in the Middle Lake Roosevelt



Land Base (in acres)

Federal	122,147	17.4%
State	25,672	3.7%
Local	-0-	-0-
Tribal	378,678	53.8%
Private	176,303	25.1%

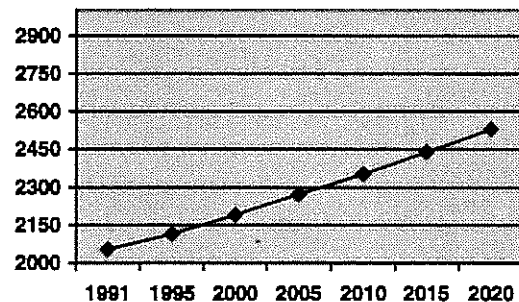
Principal Economic Activity (as total wages)

Manufacturing	12%
Retail Trade	13%
Services	14%
Government	39%
Agriculture/Forestry	3%

Population

There are approximately 2,113 people living in the Middle Lake Roosevelt Basin. The primary population centers are Fruitland and Cedonia. The majority of people live in unincorporated areas.

Projected population trends



Counties

Ferry (72%)
Stevens (28%)

Special purpose districts

Conservation Districts: Stevens County; Ferry

Principal Cities

Fruitland Hunters
Cedonia Kewa
Inchellum Gifford

Reservation Lands

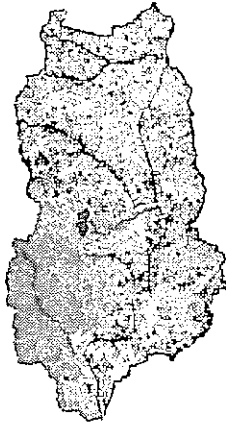
Colville Confederated Tribes
Spokane Tribe

Environment

Rugged, high mountains are the dominant feature of this region. Elevations are generally 1,300 to 8,00 feet. Mountains have sharply-crested ridges and steep slopes cut by steep walled narrow stream valleys. Soils are derived from acidic rock. Potential natural vegetation includes

western white pine, lodgepole pine, western red cedar, Douglas fir, wheatgrass, fescue, and needlegrass.

303(d) listed waterbodies



Total Maximum Daily Loads

2 TMDLs required from the 1998 303(d) list

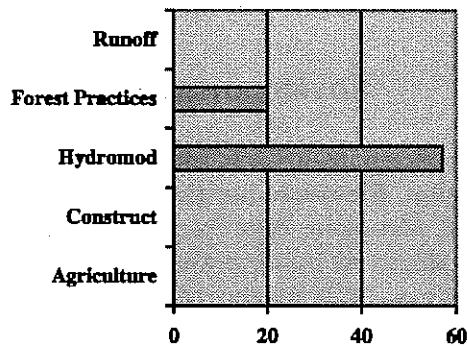
303(d) listed Problem Areas

Sediment bioassay in Franklin D. Roosevelt Lake

Mercury in Franklin D. Roosevelt Lake

High temperature in Sherman Creek

Stream Miles Impacted by Source



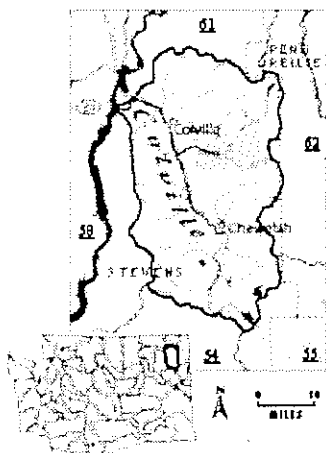
Unified Watershed Assessment Critical Environmental Information

Water	
Flow	Healthy
Quality	Threatened
TMDLs	Required
Public Health	
Shellfish	None
Drinking Water	Healthy
Nitrates	Impaired
Fish	Healthy

Water Quality Programs in WRIA #58

1. Phase II lake restoration for Twin Lakes
2. U.S. Forest Service and Ferry Conservation District, solutions to temperature problems in Sherman Creek

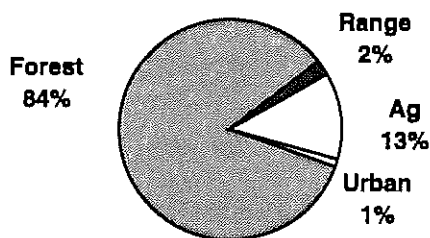
Colville Basin - WRIA #59



WRIA #59 drains about 650,482 acres. This watershed is part of the Northern Rockies ecoregion. Average annual rainfall is 18 inches per year in the valley bottom, and 36 in the higher elevations.

Demographics

Land use in the Colville Basin



Land Base (in acres)

Federal	158,247	24.3%
State	75,845	11.7%
Local	-0-	-0-
Tribal	-0-	-0-
Private	416,390	64.0%

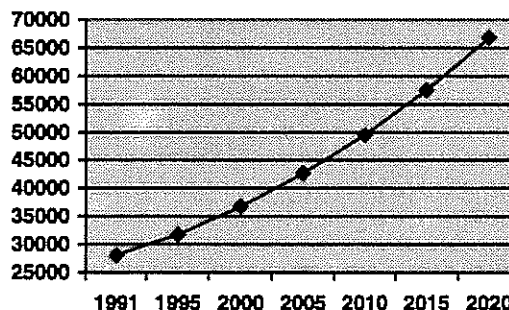
Principal Economic Activity (as total wages)

Agriculture/Forestry	2%
Manufacturing	21%
Retail Trade	17%
Services	24%
Government	25%
Other	11%

Population

There are approximately 31,668 people living in the Colville Basin. The primary population centers are Colville, Chewelah, and Kettle Falls. The majority of people live in unincorporated areas.

Projected population trends



Counties

Stevens (99%)
Pend Oreille (1%)

Special purpose districts

Conservation Districts: Stevens County

Principal Cities

Colville Chewelah
Kettle Falls Springdale
Valley Addy

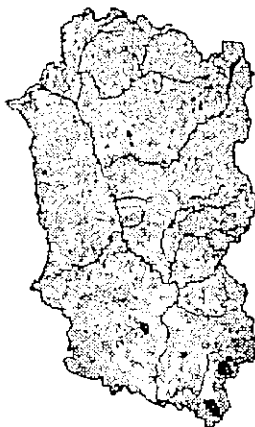
Reservation Lands

None

Environment

Rugged, high mountains are the dominant feature of this region. Elevations are generally 1,300 to 6,880 feet. Mountains have sharply-crested ridges and steep slopes cut by steep walled narrow stream valleys. Soils are derived from basic rock. Potential natural vegetation includes western white pine, lodgepole pine, western red cedar, Douglas fir, wheatgrass, fescue, and needlegrass.

303(d) listed waterbodies



Total Maximum Daily Loads

28 TMDLs required from the 1998 303(d) list

303(d) listed Problem Areas

Dissolved oxygen in Blue Creek, Chewelah Creek, Colville River, Sheep Creek, and Stensgar Creek

Fecal coliform in Blue Creek, Chewelah Creek, Colville River, Cottonwood Creek, Haller Creek, Huckleberry Creek, Jump-Off-Joe Creek, Little Pend Oreille River, Mill Creek, Sheep Creek, Sherwood Creek, Stensgar Creek, and Stranger Creek

pH in Chewelah Creek, Colville River, and Mill Creek

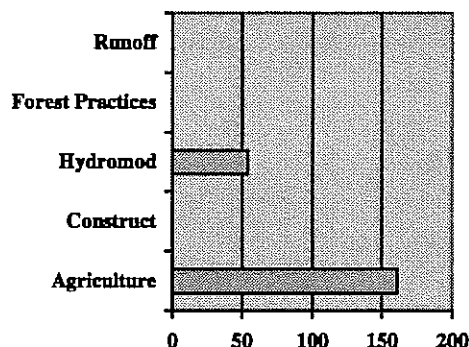
High temperature in Chewelah Creek, Colville River, and Stensgar Creek

Ammonia and Chlorine at L-Bar site on the Colville River

Other

Flooding and bank hardening for Mill Creek and Little Pend Oreille River

Stream Miles Impacted by Source



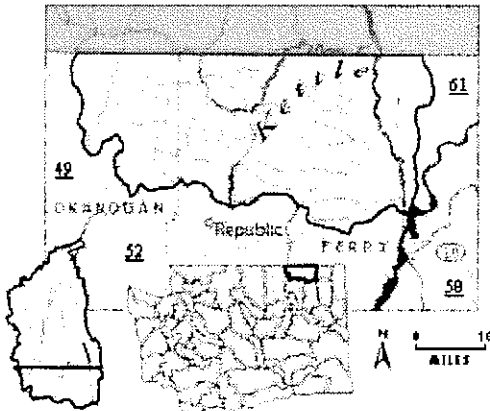
Unified Watershed Assessment Critical Environmental Information

Water	
Flow	Healthy
Quality	Threatened
TMDLs	Required
Public Health	
Shellfish	None
Drinking Water	Healthy
Nitrates	Healthy
Fish	
Fish	Healthy

Water Quality Programs in WRIA #59

1. Colville River Watershed Ranking and Planning, Stevens County CD
2. Chewelah Creek Watershed Plan, Stevens County CD
3. Jump Off Joe Creek Watershed Plan, Stevens County CD
4. Mill Creek Watershed Plan, Stevens County CD
5. Waste Water Treatment Plant upgrades for cities of Colville and Chewelah
6. Huckleberry Creek Watershed analysis, USFS
7. Upper Columbia River Watershed Ranking, Stevens County CD

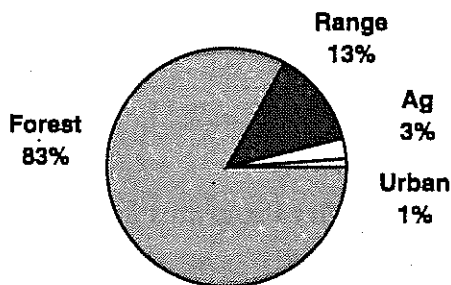
Kettle Basin - WRIA #60



WRIA #60 encompasses about 654,844 acres. The two ecoregions include the Northern Rockies and Columbia Basin. Average annual rainfall is 18 inches per year.

Demographics

Land use in the Kettle Basin



Land Base (in acres)

Federal	378,902	57.9%
State	45,591	7.1%
Local	-0-	-0-
Tribal	-0-	-0-
Private	229,351	35.0%

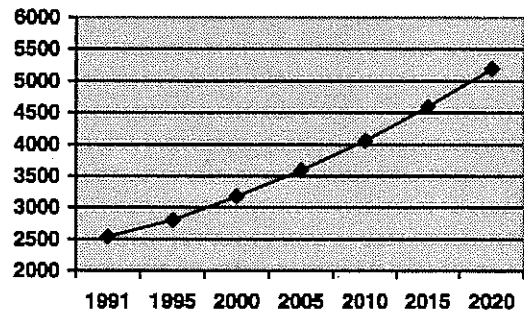
Principal Economic Activity (as total wages)

Manufacturing	12%
Retail Trade	13%
Services	14%
Government	39%
Agriculture/Forestry	3%

Population

There are approximately 2,804 people living in the Kettle Basin. The majority of people live in unincorporated areas.

Projected population trends



Counties

Ferry (66%) Okanogan (24%)
Stevens (10%)

Special purpose districts

Conservation Districts: Ferry; Okanogan; Stevens County

Principal Cities

Chesaw Danville
Curlew Malo
Laurier Orient

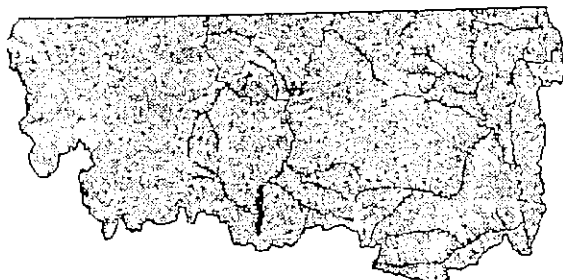
Reservation Lands

None

Environment

Rugged, high mountains are the dominant feature of this region. Elevations are generally 1,300 to 8,00 feet. Mountains have sharply-crested ridges and steep slopes cut by steep walled narrow stream valleys. Soils are derived from acidic rock. Potential natural vegetation includes western white pine, lodgepole pine, western red cedar, Douglas fir, wheatgrass, fescue, and needlegrass.

303(d) listed waterbodies



Total Maximum Daily Loads

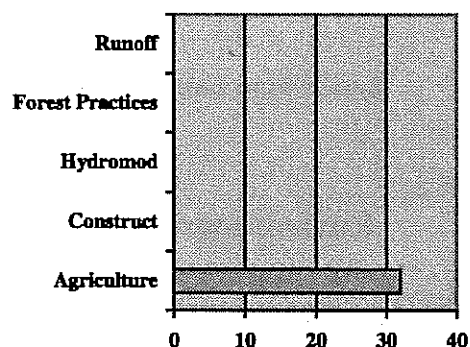
8 TMDLs required from the 1998 303(d) list

303(d) listed Problem Areas

Fecal coliform in Cottonwood Creek, Lambert Creek, Lone Ranch Creek, Martin Creek, St. Peter Creek, and Trout Creek

pH in Pierre Creek

Stream Miles Impacted by Source



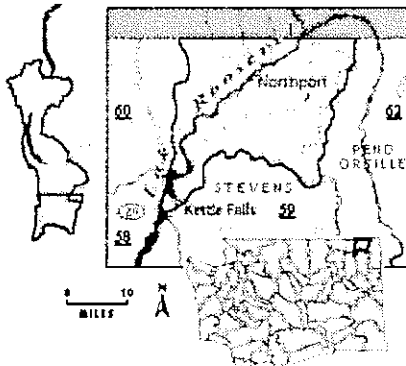
Unified Watershed Assessment Critical Environmental Information

Water	
Flow	Healthy
Quality	Impaired
TMDLs	Required
Public Health	
Shellfish	None
Drinking Water	Healthy
Nitrates	Healthy
Fish	Healthy

Water Quality Programs in WRIA #60

1. Watershed BMP Implementation Project, Ferry CD

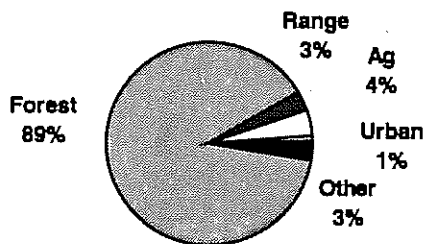
Upper Lake Roosevelt - WRIA #61



WRIA #61 encompasses about 370,061 acres in the northeast corner of the state. This watershed is part of the Northern Rockies ecoregion. Average annual rainfall is 24 inches per year.

Demographics

Land use in Upper Lake Roosevelt



Land Base (in acres)

Federal	110,458	29.9%
State	34,742	9.4%
Local	-0-	-0-
Tribal	-0-	-0-
Private	224,861	60.7%

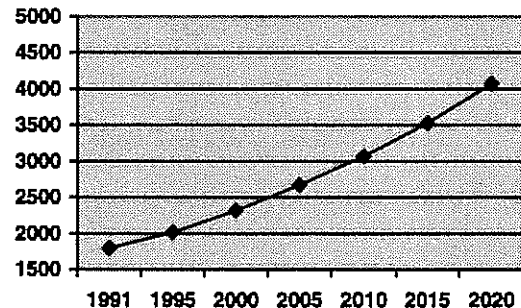
Principal Economic Activity (as total wages)

Agriculture/Forestry	2%
Manufacturing	21%
Retail Trade	17%
Services	24%
Government	25%
Other	11%

Population

There are approximately 2,012 people living in the Upper Lake Roosevelt Basin. The primary population centers are Kettle Falls and Northport. The majority of people live in unincorporated areas.

Projected population trends



Counties

Stevens (94%)
Pend Oreille (6%)

Special purpose districts

Conservation Districts: Stevens County; Pend Oreille

Principal Cities

Kettle Falls Northport
Marcus

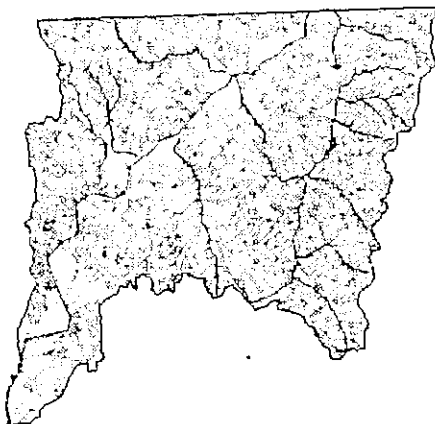
Reservation Lands

None

Environment

Rugged, high mountains are the dominant feature of this region. Elevations are generally 1,300 to 8,000 feet. Mountains have sharply-crested ridges and steep slopes cut by steep walled narrow stream valleys. Soils are derived from basic rock. Potential natural vegetation includes western white pine, lodgepole pine, western red cedar, Douglas fir, wheatgrass, fescue, and needlegrass.

303(d) listed waterbodies



Total Maximum Daily Loads

11 TMDLs required from the 1998 303(d) list

303(d) listed Problem Areas

Aquatic Plants in Deep Lake

Total Dissolved Gas Lake Roosevelt

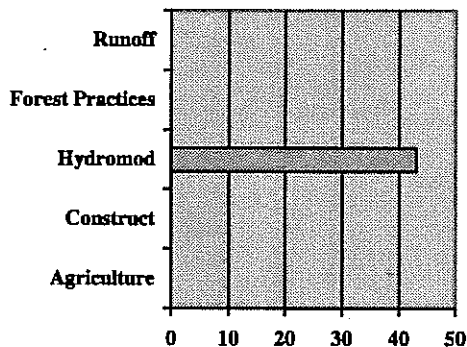
Sediment bioassay in Lake Roosevelt

Fecal coliform in Crown Creek, Flat Creek, Meadow Creek, and Smackout Creek

High temperature in Deep Creek and Lake Roosevelt

pH in Deep Creek and Smackout Creek

Stream Miles Impacted by Source



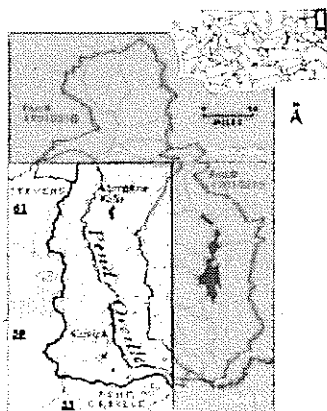
Unified Watershed Assessment Critical Environmental Information

Water	
Flow	Healthy
Quality	Threatened
TMDLs	Required
Public Health	
Shellfish	None
Drinking Water	Healthy
Nitrates	Healthy
Fish	Healthy

Water Quality Programs in WRIA #61

1. Onion Creek Watershed Management Plan, Stevens CD
2. Onion Creek Watershed Analysis, Boise Cascade
3. Big Sheep Creek Watershed Analysis, Boise Cascade
4. Lake Roosevelt Water Quality Council (inactive)
5. Upper Columbia River Watershed Ranking, Stevens CD

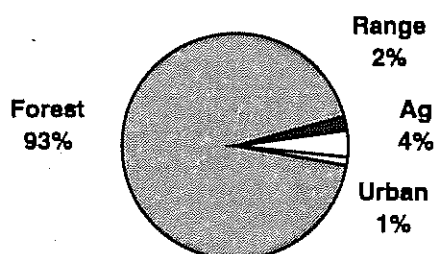
Pend Oreille Basin - WRIA #62



WRIA #62 encompasses about 794,546 acres. This watershed is part of the Northern Rockies ecoregion. Average annual rainfall is 34 inches per year.

Demographics

Land use in Pend Oreille Basin



Land Base (in acres)

Federal	503,962	63.4%
State	28,102	3.5%
Local	-0-	-0-
Tribal	4,541	.6%
Private	257,941	32.5%

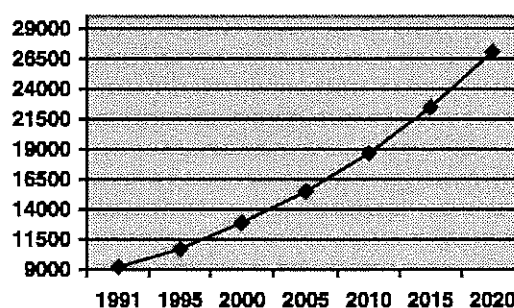
Principal Economic Activity (as total wages)

Agriculture/Forestry	1%
Manufacturing	16%
Retail Trade	16%
Services	15%
Government	43%
Other	8%

Population

There are approximately 10,700 people living in the Pend Oreille Basin. The primary population centers are Newport and Ione. The majority of people live in unincorporated areas.

Projected population trends



Counties

Pend Oreille (97%)
Stevens (3%)

Special purpose districts

Conservation Districts: Pend Oreille; Stevens County

Principal Cities

Newport	Ione
Metaline Falls	Metaline
Cusick	Tiger

Reservation Lands

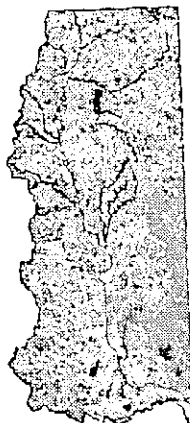
Kalispel Tribe

Environment

Rugged, high mountains are the dominant feature of this region. Elevations are generally 1,300 to 8,00 feet. Mountains have sharply-crested ridges and steep slopes cut by steep walled narrow stream valleys. Soils are derived from acidic rock. Potential natural vegetation includes western white pine, lodgepole pine, western red

cedar, Douglas fir, wheatgrass, fescue, and needlegrass.

303(d) listed waterbodies



Total Maximum Daily Loads

8 TMDLs required from the 1998 303(d) list

303(d) listed Problem Areas

Exotic aquatic plants and temperature in Box Canyon Reservoir.

Milfoil found in Diamond Lake

Bank sloughing and hardening along Pend Oreille River

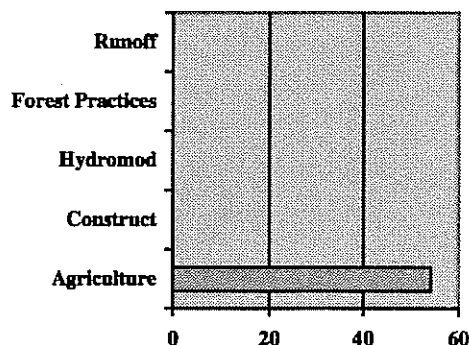
Sedimentation of bull trout and westslope cutthroat habitat.

High temperature in Lost Creek, Cedar Creek, and Pend Oreille River

pH in Pend Oreille River

Fecal coliform in Skookum Creek

Stream Miles Impacted by Source



Unified Watershed Assessment Critical Environmental Information

Water	
Flow	Healthy
Quality	Threatened
TMDLs	Required
Public Health	
Shellfish	None
Drinking Water	Healthy
Nitrates	Healthy
Fish	Healthy

Water Quality Programs in WRIA #62

1. Water quality studies in Box Canyon Reservoir - Pend Oreille PUD
2. Phase II Restoration in Lake Sacheen
3. Tri-state Council monitoring and implementation in the Pend Oreille
4. TFW watershed analysis in LeClerc Creek
5. Pend Oreille River water quality education, Pend Oreille CD
6. Pend Oreille Watershed Planning, Pend Oreille CD
7. Pend Oreille Watershed Assessment, Pend Oreille CD
8. 2514 Watershed Planning underway

APPENDIX B.

DRAFT

Memorandum of Agreement

Between

US Forest Service

And

State of Washington

(DRAFT April, 1999)

MEMORANDUM OF AGREEMENT
between the
USDA FOREST SERVICE, REGION 6
and the
WASHINGTON STATE DEPARTMENT OF ECOLOGY

This Memorandum of Agreement (MOA), together with documents in the appendix is entered into by and between the U.S. Forest Service (hereinafter referred to as the Forest Service) and the Washington State Department of Ecology (hereinafter referred to as Ecology). This MOA and attached planning and guidance documents collectively represent the "Forest Service Pacific Northwest Region Water Quality Management Plan for Washington State" The Forest Service and Ecology agree that this MOA, with attachments, is the implementation plan for execution of this agreement and is a priority within their organizations. Timely implementation will prevent duplication of effort and provide coordination to meet CWA requirements and the goals of both agencies. The Forest Service and Ecology recognize financial commitments are necessary to support these increased management commitments.

Nothing in this statewide MOA shall preclude individual National Forests from entering into agreements with Ecology regional offices to meet specific local needs. Any such local MOA shall fit within the parameters of this statewide MOA.

PURPOSE

The purposes of this MOA are:

1. For Ecology and the Forest Service to commit to the responsibilities and activities to be performed by each agency pursuant to the general water quality management guidelines and processes referenced above.
2. To ensure Forest Service activities meet Federal Clean Water Act (CWA) requirements of:
 - a. §303 (Water quality standards and implementation plans) of the Clean Water Act;
 - b. Section 313 of the Clean Water Act (Federal facilities pollution control) ;
 - c. Sections 319(b)(2)(f) and 319(k) (Nonpoint source management program) of the Clean Water Act as amended in 1987 (PL-100-4);
 - d. Executive Order 12088. (FS to provide citation.)
3. To affirm the Forest Service as the Designated Management Agency responsible for meeting CWA standards on National Forest System lands and to ensure that all waters on National Forest lands meet or exceed water quality standards for all activities.
4. To encourage and enhance communication, coordination and working relationships between the agencies and lay out a process for dispute resolution.

AUTHORITIES

The U.S. Congress has assigned the Forest Service the responsibility for managing Nation Forest System lands. Forest Service cooperation and coordination with Ecology is consistent with that legislation.

In Washington state, Ecology has received delegation from the U.S. Environmental Protection Agency (EPA) for federal Clean Water Act implementation. Chapter 90.48 RCW gives Ecology authority and responsibility to protect and manage water quality,

Section 303(d) of the Clean Water Act lists water bodies and outlines a program for addressing water body segments having limitations on their quality that preclude them from meeting beneficial uses. The Forest Service is responsible for those water bodies within the National Forest System.

Section 313 of the Clean Water Act and Executive Order 12088 require the Forest Service to adhere to the goals set forth in the State Surface Water Quality Standards (i.e. Chapter 90.48 RCW).

Section 319 of the Clean Water Act requires states to develop nonpoint source pollution management programs to qualify for Federal grants to control nonpoint source pollution. This MOA is a component of that program.

An important component of the State Surface Water Quality Standards is the concept that nonpoint source pollution is best controlled by prevention land use practices designed to prevent and mitigate water quality impacts. These best management practices (BMPs) for forest management on non-federal lands are codified in the state Forest Practices Rules (Title 222 WAC). Activities on National Forest System lands are expected to meet or exceed the requirements that apply were those activities on state-regulated lands. BMPs are also recognized as the primary mechanism to control nonpoint source pollution from activities other than forestry such as recreation, mining, fish and wildlife restoration, livestock grazing, fire suppression etc.

MUTUAL RESPONSIBILITIES

Staff from the Forest Service Regional Office and Ecology headquarters will meet at least annually. Ecology's Water Quality Program Manager (or designee) will initiate contact with the Forest Service Region 6 representative to set this meeting, to be held in the last quarter of each calendar year. Suggested topics for the annual meeting are:

- Discussion of the "Annual Forest Reports" for each National Forest in Washington;
- Discussion of Ecology's Watershed Planning efforts in areas pertinent to National Forests;
- Water bodies and segments listed on the §303(d) list.
The USFS and Ecology will jointly, on an annual basis and in conjunction with local offices, develop a priority list of those basins with critical water quality problems to which management and restoration can be directed. The water-quality limited list (§303(d)) and the Forest Service §303(d) Protocol will be the starting point for the joint list. The agencies will also work jointly to obtain funding to support work to address the problem areas on the list.
- Water quality restoration plans (WQRPs) and water quality cleanup plans (Total Maximum Daily Load [TMDLs] plans) on National Forest system and adjacent lands;
- Discussion of monitoring programs and results;
- Coordinate to ensure water quality standards are being met;
- Ascertain the need for joint public involvement efforts for appropriate projects;
- Funding priorities;
- Updating of contacts lists;
- Other topics as mutually agreed and needed for coordination (such as changes to laws and regulations)

Other governmental agencies may be invited to the annual meeting with agreement from both the Forest Service and Ecology. Other meetings, as appropriate, will be held between the Forest Service and Ecology (and other state agencies with cooperative water quality management responsibilities) to evaluate compliance with the terms of this MOA.

The agencies will seek opportunities to coordinate and collaborate on management activities, such as monitoring, water quality planning, and restoration projects. The agencies will conduct joint reviews of

project implementation areas with field staff to determine if BMPs are being implemented and if management efforts (e.g. WQRPs, BMPs, etc.) are effective in protecting water quality.

Forest Service Responsibilities.

The Forest Service will manage its lands and activities to meet or exceed state water quality standards. The Forest Service agrees to:

1. Implement site specific BMPs to protect water quality and beneficial uses that meet or exceed state BMPs for similar activities and conditions.
2. Conduct monitoring as required in Forest Plans to determine, in consultation with Ecology, the implementation of BMPs and their effectiveness in meeting water quality standards. The Forest Service will normally measure BMP effectiveness for turbidity and temperature. The Forest Service will notify Ecology if there is a departure from this normal procedure. Ecology and the Forest Service will collaborate on monitoring other water quality parameters to be used on a project specific basis.
3. Take appropriate corrective action in the field, on National Forest System Lands, to remedy exceedances of state water quality standards. Notify appropriate Ecology regional office when water quality problems (such as hazardous materials spills, water discoloration from excessive sediment, etc.) are noted on nonfederal lands in the vicinity of National Forest System lands. In an emergency situation (such as a spill), agencies will take appropriate "first response actions" in accordance with expertise and training, and notify state, local and/or federal agencies with jurisdiction.
4. Coordinate with Ecology in development and implementation of Water Quality Restoration Plans and Clean Water Action Plan (CWAP) activities..

Forest Service Reporting Requirements to Ecology

Each year the Forest Service develops an Annual Forest Report which includes monitoring information (including for TMDL compliance), WQRP activities, and CWAP status. The Forest Service will send these National Forest-specific reports to the Department of Ecology Water Quality Program Manager by December 31 of each year.

Ecology Responsibilities

Ecology is the lead agency for planning and implementing the Clean Water Act. They are to ensure that Forest Service programs meet or exceed Clean Water Act requirements. It is noted that other State agencies, such as the Department of Natural Resources, carry out activities related to water quality management under separate cooperative agreement with Ecology. Ecology agrees to:

1. Provide review and input on National Environmental Policy Act processes and documents, such as Environmental Assessments, Environmental Impact Statements, etc. The Forest Service will contact the appropriate Ecology office.
2. Provide input to interdisciplinary teams to help develop/identify alternatives and mitigation measures for proposed land management activities (e.g. timber management, grazing, mining, vegetation management, special uses, recreation, etc) for protecting water quality.
3. Provide technical information to the Forest Service, as requested.
4. Notify local Forest Service offices if water quality problems are noted on or in the vicinity of National Forest System lands.

5. Coordinate with the Forest Service in development of Water Quality Cleanup Plans (TMDLs) and Clean Water Action Plan (CWAP) activities..
6. Work with the responsible Forest Service officials to obtain appropriate corrective action when management activities (past or present) are causing water quality standards to be exceeded.
7. Coordinate issues of water quality management that arise between the Forest Service and state agencies pertaining to water quality regulatory responsibilities.

Ecology Process to Certify Forest Service Management Activities

It is Ecology's responsibility to certify general water quality BMPs and current Forest Plans as being consistent with the Clean Water Act. The certification process requires the evaluation of state BMPs against Forest Service BMPs, a processes for designing and implementing BMPs and a process for addressing differences between the two sets of BMPs. The underlying evaluation criteria will be whether or not Forest Service BMPs meet or exceed water quality standards.

The State BMPs for forest practices are the water quality related forest practices rules (WAC 222) promulgated by the Washington Forest Practices Board and adopted by reference by the Department of Ecology (Ch. 173-202 WAC). Non-forestry BMPs for other land management activities are those developed and accepted by Ecology and other agencies and which may or may not be codified (such as BMPs in the Natural Resources Conservation Service's Field Office Technical Guide).

When Ecology determines that Forest Service BMPs and BMP processes meet or exceed state-adopted BMPs, Ecology shall certify the included Forest Service BMPs in a letter to the Regional Forester from the Ecology Water Quality Program Manager or designee.

When Ecology or the Forest Service determines through BMP effectiveness monitoring that Forest Service BMPs are providing less resource protection than the adopted or approved state BMPs, the Forest Service shall review the ineffective BMPs for amendment. Any proposed amendments to the Forest Service BMPs shall be reviewed for certification by Ecology. The state "antidegradation" policy goes into effect if Forest Service BMPs are being met, but water quality standards are not achieved.

Non-Forestry BMPs

It is the intent of the Forest Service and Ecology for management activities to meet Clean Water Act standards. Activities will be directed toward that end and Ecology may certify other non-forestry related Forest Service BMPs on a case-by-case basis. Examples of these types of activities might be grazing, mining, vegetation management, special uses, recreation, or other activities with a potential for affecting water quality.

RESPONSIBILITY AND COORDINATION

The Director of Ecology and the Region 6 Regional Forester are the responsible officials for ensuring implementation of this Agreement. The names and addresses of specific contacts are in the appendix.

The Director of Ecology hereby assigns the primary responsibility to coordinate implementation of Ecology aspects of this MOA to the Water Quality Program Manager.

The Forest Service Regional Forester hereby assigns the primary responsibility to implement this MOA to the Director of Natural Resources in the Forest Service Regional Office in Portland, Oregon.

DISPUTE RESOLUTION

This dispute resolution process may be invoked by either or both of the parties. If possible, the parties should agree on how much time to spend on this process and what outcome they want to achieve.

Both agencies are committed to work together to meet the requirements of the Clean Water Act and other requirements. Should disputes arise, they will be resolved at the most local level possible. The local offices of each agency (either the Ranger District or Supervisor's Office for the Forest Service, and the Regional Office for Ecology) will outline the issue describing the background, including a problem statement, what the issues are, why the issue is not resolved, a description of alternatives examined describing pro's and con's, and a recommendation. They may request assistance from the Forest Service Regional Office, Ecology headquarters, or both.

If the above approach fails, the Forest Service Regional Office and Ecology headquarters will assess the issue and describe a method(s) for resolution. They will meet with local staff for input and discussion.

Should the above approaches fail the issue will be written up for the Regional Forester and the Director to discuss and resolve.

Other agencies or entities (such as EPA) may be requested to assist at any step.

ADMINISTRATIVE

1. This MOA may be periodically revised, updated, or refined as necessary, by mutual agreement by both the Forest Service and Ecology.
2. This MOA will remain in effect unless replaced by another MOA, terminated by mutual consent of the parties, or canceled by 30 days' written notice from one party to the other party.
3. Nothing herein shall be construed as obligating or as involving either party in any contract or other obligation for the future payment of money in excess of appropriations authorized by law and administratively available for this work.
4. This MOA will serve as the basis for any cooperative interagency job positions, or monitoring projects, that may be established to help fulfill the commitments herein.
5. Nothing in this MOA detracts from obligations of any other MOA by either agency.

We, the undersigned officials responsible for implementing this MOA and applicable attachments, hereby commit the necessary resources to the extent possible to effectively implement all aspects of this MOA.

We understand that successful implementation of the MOA and the accompanying attachments by the Forest Service and Ecology will: 1) satisfy State and Federal nonpoint source pollution requirements; 2) better ensure water quality protection on National Forest System lands, and 3) will constitute the basis for continuing formal designation by the Governor of the state of Washington of the Forest Service as the implementing agency for nonpoint source pollution control on lands under its jurisdiction.

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

Regional Forester

Director

Pacific Northwest Region

Date: _____

Date: _____

APPENDICES of ATTACHMENTS

FOREST SERVICE AND ECOLOGY PLANNING AND GUIDANCE DOCUMENTS

Forest Service or Federal documents

1. FEMAT – Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl;
2. Interior Columbia Basin Management Project Program;
3. Northwest Forest Plan;
4. Clean Water Action Plan (Including Unified Watershed Assessment);
5. Forest Service and Bureau of Land Management Protocol for Addressing Clean Water Act Section 303(d) Waters..

Department of Ecology and State Documents

1. Water Quality Standards for Surface Waters of the State of Washington - Chapter 173-201 WAC;
2. 1998 §303(d) Listing of Impaired Water Bodies
3. Water Quality Standards for Surface Waters of the State of Washington (Chapter 173-201 WAC);
4. Forests and Fish Report (Feb. 22, 1999)

AGENCY CONTACTS

Forest Service

Department of Ecology

Ecology Spill response contacts

Appendix C.

Local Priority Setting Process

Summary

In the state fiscal year 2000 grant and loan process last year, Ecology included an approach for awarding points based upon locally derived priorities. This was part of an overall pilot grant and loan process recommended to Ecology in November 1998 by the Financial Assistance Restructuring Committee. The Committee recommended Ecology allow for a total of up to 100 points of the project evaluation criteria to be awarded to eligible projects that have been ranked by local governments, tribes, conservation districts, and certain special purpose districts. These points are referred to as local prioritization points.

Applicants and administrators reported numerous difficulties in implementing the local prioritization process last year. Nonetheless, over 80 percent of all projects proposed last year were awarded points for submitting local priorities. In summer 1999, the successes and problems of the local prioritization process were presented to the Water Quality Financial Assistance Council. The Council recommended that Ecology retain, but make improvements to the local prioritization process.

Changes from FY 2000

For state fiscal year 2001, Ecology's Water Quality Financial Assistance Council has recommended changes to improve the local prioritization process. Those changes are included in this guidance and are summarized as follows:

All Local Priorities Must be Contained Within a Water Resource Inventory Area: Last year, applicants were given a choice of using a water resource inventory area (WRIA) or a county boundary for listing priorities. This year, points will be awarded only to priorities submitted on a WRIA basis.

Fewer Signatures are Required: Instead of needing signatures from every member comprising a required organization (e.g. every city within a project proposal WRIA), signatures will be required only from the largest city (population), largest (service area) conservation district, largest (service area) special purpose district providing wastewater services, all counties with jurisdictional responsibility for at least 25 percent of the area within the WRIA boundary, and all Indian tribes with reservations or fishing rights.

Organized Local Planning Groups:

As an alternative to submittals from the five required organizations, an organized local planning group may also submit a statement of agreed priority provided they represent at least three of the five required organizations and they have informed those required organizations not participating of their intent and submitted priorities.

Definitions

Project Proposal WRIA: In order to be eligible for local priority points, the project proposal area shall be a Water Resource Inventory Area.

Required Organizations: Governmental entities or special districts as follows:

City - the largest (in population) incorporated city, town or municipal corporation within the project proposal WRIA.

Counties - all counties with jurisdictional responsibility for at least 25 percent of the area within the project proposal WRIA boundary.

Conservation District - the largest (service area) organized and operating conservation district within the project proposal WRIA.

Special Purpose District - the largest (in population) special purpose district (public) providing wastewater services, including but not limited to sewer, water & sewer districts, or public utility districts within the project proposal WRIA.

Tribes - all federally-recognized tribes with reservations or fishing rights within the project proposal WRIA.

Organized Local Planning Group: An organized local planning group sponsored and operating with the support and assistance of local governments and which includes representatives of three or more required organizations. Organized local planning groups may include planning units organized under Chapter 90.82 RCW (Watershed Planning Act), 2496 (Salmon Recovery Act), or Chapter 400-12 WAC (Puget Sound Watershed Planning).

Statement of Agreed Priority: A written document that contains a numeric priority ranking for eligible projects within a project proposal WRIA and which contains the signatures of representatives of the required organizations and/or organized local planning group agreeing to support or not object to the specific ranking included.

Eligibility Requirements for Local Prioritization Points

Local prioritization is elective and applicants do not have to engage in or complete this process to be eligible for funding consideration. However, projects will not be awarded local prioritization points if the process described here is not followed. The maximum points available through the local prioritization process is 100 points.

Applicants within a given WRIA boundary must decide among themselves on how they will convene and conduct the prioritization process. An organized local planning group may already be in existence which can be utilized or representatives from the required organizations can be contacted and a process developed to solicit their input for priorities. Additionally, it is up to the applicants, or those participating in the local participation process, to decide among themselves on how the statement of agreed priorities will be completed and submitted to Ecology.

Process for Establishing Local Priorities

In order to be eligible for local prioritization points, the following must occur:

1. All projects proposed for local prioritization must meet all funding program eligibility requirements.

2. Only one statement of agreed priority can be submitted per WRIA.
3. All projects proposed for local prioritization must be assigned a numeric priority (e.g., 1, 2, 3, etc.).
4. Only one project per WRIA shall be given a unique ranked number (i.e., only one number 1 prioritized project, only one number 2 prioritized project, etc.) regardless of the number of projects proposed or regardless of the entity proposing the projects. If more than one project within a project proposal WRIA is submitted with the same ranked number, neither of the conflicting projects will receive local prioritization points.
5. All statements of agreed priority must include original signatures. If multiple documents are submitted to expedite signature collection, all submittals must contain original signatures.
6. Signatures must be from at least one of the following levels of authority: Mayor; Tribal Chair; County Executive; City Manager; Chair of an elected commission or council; or lead agency representative for organized local planning group. If signatures other than those specified above are used, a statement of delegated authority must be provided to validate the signature indicated.

If a statement of agreed priority is submitted from the five required organizations, only one signature is required from each of the organizations within the project proposal WRIA.

Signature means that the respective organization is in agreement with or does not object to the assigned numeric priorities reflected in the project proposal WRIA.

7. If a statement of agreed priority is submitted from a organized local planning group, only one signature is required from the organizing body of that group. Signature means that the organized local planning group is in agreement with or does not object to the assigned numeric priorities reflected in the project proposal WRIA. All required organizations not represented on the organized local planning group must be notified by registered or certified mail of the group's intended priorities. Objections by the non-represented group can be used to disqualify the submitted priorities from local prioritization points.
8. Any required organization can object to the numeric priorities submitted in their respective project proposal WRIA. Objections with a stated rationale on specific proposed projects must be submitted to Ecology in writing. If received by Ecology, Ecology will (a) forward the objection to those submitting the statement of agreed priority for resolution; or (b) disqualify all priorities within the WRIA from being awarded local prioritization points.

9. Ecology will award points based upon successful completion of the local prioritization process. Where successfully completed, projects ranked number one through ten will be separated by increments of ten-points while projects ranked 11th and greater will receive five points each. Non-ranked projects will receive zero points.
10. Ecology may also consider awarding points to projects on a case by case basis where statements of agreed priority are not signed by all required organizations. However, since Ecology is making it easier for groups to submit statements of agreed priorities this year (i.e., all entities within a watershed are no longer to submit signatures, only the largest), Ecology will typically NOT award local priorities points where a required group is missing and written proof of reasonable and prudent efforts to notify that group is not submitted to Ecology
11. The Department of Ecology must receive the statement of agreed priority no later than April 14, 2000.

STATEMENT OF AGREED PRIORITY

DATE

Kim McKee
Financial Management Section
Water Quality Program
Department of Ecology
PO Box 47600
Olympia, Washington 98504 - 7600

Re: FY 2001 Grant/Loan Application - Statement of Agreed Priority

Dear Mr. McKee:

We the undersigned submit the following project(s) for consideration of local prioritization points under the funding selection process for state fiscal year 2001 Centennial Clean Water Fund, Washington State Water Pollution Control Revolving Fund, and Clean Water Act Section 319 Nonpoint Source Fund consideration.

Water Resource Inventory Area (WRIA) # _____

Proposed Project Ranking:

Locally Ranked Project	Project Title (Insert title and other means for identifying the project here. Attach additional information, if needed).
# 1	
# 2	
# 3	
# 4	
# 5	
# 6	
# 7	
# 8	
# 9	
# 10	
> #10	
Non-ranked	

We the undersigned certify that we are legally authorized representatives of water quality entities for prioritizing environmental and water quality projects and initiatives within the project area. We certify that we agree or do not object with the numerical priority ranking for proposals given in this letter. Additionally, we certify that no other eligible water quality project for the proposed project area has or will be submitted to the Department of Ecology with the same priority ranking given in this letter.

Signed:

Title of Local Planning Group

And / Or

County(s)

City

Conservation District

Special Purpose District

Tribe(s)

Appendix D.

Responsiveness Summary to Comments received on the Public Review Draft

Bellingham Workshop - 10/11/99

1. No comments
-

Olympia Workshop - 10/12/99

1. Do we need Section 7 consultation?

Response: Section 7 Consultation is required on actions that may impact ESA. At this time no Section 7 Consultation is in the works since this is a plan. Actions taken as a result of this plan may need Section 7.

2. Does the state/locals encourage use of pesticides? This question was part of the comment on encourage v control of pesticides.

Response: Page 5-24 and 5-102 address use of pesticides. However, during the implementation development stage, we will work with Department of Agriculture and WSU Coop Extension to see if more can be done.

3. Can the plan do more to encourage IPM?

Response: We agree more can be done. We will work with WSU Coop Extension in devising recommendations to address this issue. (see page 5-24)

4. How can the plan address rainwater collection for summer watering?

Response: This plan is not the appropriate forum for that issue.

5. Improve Table of Contents.

Response: Done

6. Discuss the relationship of instream flows to nonpoint source pollution control.

Response: We have done this as best we can. Page 4-1 discusses the Watershed Planning Act and the Salmon Recovery Act, both of which emphasize flow. We link plan recommendations with both efforts.

7. Discuss stormwater impacts on habitat.

Response: The stormwater manual is currently in draft form. As we get more information and consensus on habitat impacts, we will present them. Stormwater runoff is surfacing as a major issue in this state.

8. Is there a long-term commitment for on-site education?

Response: There is a long-term commitment for on-site education, however, as the discussion on page 5-89 states, the state and local agencies lack resources (financial and personal) to fully implement all provisions. The recommendations have been left in in hopes that funding opportunities will increase.

9. Discuss GMA and shellfish.

Response: We have discussed shellfish response strategy and GMA. We are not sure what is the intent of the comment.

Ellensburg Workshop 10/13/99

1. Will the bar always get higher for agricultural producers? When will standards stop being raised?
2. It is important to get baseline data so we can show improvements.

Response: We agree. Even though there is no coordinated statewide strategy for monitoring, we propose to continue with current monitoring efforts (page 12-2) as well as increasing baseline monitoring (page 2-8) and evaluating water quality changes over time (page 2-9)

3. How can you resolve research conflicts?

Response: Resolving research conflicts is not the purpose of this plan. We understand that conflicts do arise, and we only provided information in this plan where there was majority consensus.

4. Agricultural problems are diverse, we need a diverse set of solutions.

Response: We agree. We believe our approach is diverse. Trying to find a balance between education, technical and financial assistance, and enforcement has not been easy. There are people who think this plan misses enforcement opportunities, and then there are people who think this plan will lead to stronger enforcement efforts. We did the best we could in finding that balance. However, there is room for improvement. Hopefully the next five years will help identify those improvements.

5. As population grows, how applicable will this plan be?

Response: As stated in the plan (page), this plan will be updated every five years. Growth and local land use changes will be taken into account.

6. How do we make sure that state knows about federal programs that people are already implementing?

Response: Part of the federal consistency provisions of section 319 suggests that states interview federal agencies on their nonpoint programs. In Chapter 10, we discuss our process and timeline for implementing those interviews. That will give us the information about federal programs and activities.

7. Is water quality planning linked to meeting instream flows?

Response: Yes. We addressed the 2514 (Watershed Management Act) process. Since that is in its infancy, there is not much to report as to outcomes of Watershed Planning (the process to link flows with quality). We are as anxious as anyone for this to work.

8. Is the plan going to mandate expensive projects for local governments, more than grants can fund?

Response: This plan will not mandate anything. It was made clear during the public workshops that the plan is not enforceable, however, the laws that are cited in the plan are. What that means is that we only described programs and authorities that currently exist. Any action identified in the plan is there because an implementing agency as agreed to it.

9. There is a concern that voluntary compliance often leads to law once a plan is in print.

Response: Noted.

Spokane Workshop - 10/14/99

1. Clarify enforcement at both state and local levels.

Response: We added a section on enforcement. See end of Chapter 9.

2. Describe how coordination happens during program implementation.

Response: Dept. of Ecology will coordinate implementation with other state agencies. Ecology will request project reports on implementation activities, which include as best as possible, local activities. Chapter 12 outlines coordination activities, and how they will take place. However, actual coordination activities may change.

3. Stress involvement of local people as co-managers of the resources.

Response: We revised Chapter 6 to stress the value and responsibility local governments play in implementing environmental laws.

4. Graph water quality changes for the last 13 years.

Response: In Chapter 2, we graphed 4 parameters that have been tracked over the last 20 years. The changes over time reflected a violation history, and not a valid statistical trend. See Chapter 2 for a complete description. We would like to include other parameters, and have targeted flow, sediments, pesticides, and nutrients.

5. Discuss noxious weeds as a pollutant. How do you deal with those in riparian areas?

Response: Noxious weeds were not discussed in this plan. However, that does not diminish the importance of programs to deal with them.

6. How will technical transfer issues be dealt with?

Response: Through an education and effective outreach program.

7. How can we use banks and insurance companies to help solve nps pollution?

Response: Good question. We are using commodity cooperatives to help fight the nonpoint source battle, but have yet to venture into the banking and insurance arenas. Any ideas would be greatly appreciated.

Comments received from Dan Mathias, City of Everett - 4/4/99

1. Protection of endangered species is not mentioned in the mission statement, the goal statement, or as an objective. Water quality is important to salmonids, therefore it seems appropriate to include ESA in the mission, goal, and objectives.

Response: The mission statement in chapter 8 emphasizes fish among others. However, since our mandate is improving water quality through controlling nonpoint source pollution, that was necessarily our target. We did link this plan with the Salmon Strategy by adopting a large number of their recommendations for action.

2. P. 117 of contributors review draft. Top of this page there are two management measures that are not realistic. 1b states that post development loadings of TSS shall be no greater than predevelopment loadings. Under most predevelopment conditions, there is essentially no TSS. There is no proven technology that can achieve near 100% TSS removal. Item 1b should be removed. Rely instead upon the 80% criteria in 1a.

Item 2, states that to the extent practicable the volume of runoff should not increase as a result of development. Again, this is not feasible and should be deleted. The theoretically possible way to achieve this is through construction of infiltration facilities. However, infiltration facilities are not feasible in most cases due to low permeability soil and high maintenance cost.

Response: We agree that these management measures are not doable. However, they are from federal guidance and in order to receive approval for this plan, we need to address them. We

have revised our discussion and will use the draft Washington State Stormwater Manual as evidence we are dealing with the issue.

3. P. 118 of contributors review draft. The Tri-County and statewide response to the recent listing of Chinook salmon as a threatened species has resulted in several efforts to improve surface water management. These include: the stormwater workgroup, a subcommittee of the Tri-County committee; the zero impact ordinance recently adopted by the City of Lacey; and the Dept. of Ecology's draft update of its stormwater manual. These efforts should be included and discussed in the New Initiatives section.

Response: Thanks for the update. There are so many initiatives that we could have discussed, time and space limited them. Once the stormwater manual is adopted, we will do a better job of documenting efforts such as the ones you describe.

4. PP. 139-151 of contributors review draft. A sub-committee of the Tri County committee is developing a proposal for road maintenance BMPs that will be submitted to NMFS for potential inclusion in a 4(d) rule for Chinook salmon. This subcommittee's recommendations should be discussed in management measure for Roads, Highways, and Bridges.

Response: We are aware of the submittal, and have listed DOT as the lead agency for updating the state highway runoff manual. Instead of listing individual BMPs, we would like to see those recommendations as part of a bigger effort. Thanks for the reminder.

5. PP. 257-267 of contributors review draft. Many local governments in Washington State are required to monitor surface water by NPDES permits issued for wastewater treatment plant discharges and/or phase 1 stormwater discharges. Phase 2 NPDES will require monitoring for all local governments with stormwater discharges in urbanized areas. Furthermore, the 4(d) rule for Chinook salmon to be issued by NMFS will likely also increase monitoring requirements by local governments. These monitoring efforts by local governments should be discussed in chapter 11. Hopefully, when the recommendation section of this chapter is developed it will address coordination and consistency between these numerous monitoring programs at the state and local level.

Response: Discussion of NPDES permit monitoring was added to Chapter 2, section on water quality assessment.

Comments received from Toby Thaler - Washington Forest Law Center

1. Appendix A contains much useful information. One item is the "Principal Economic Activity" breakdown for each WRIA. Since I am working on a matter in the Pend Oreille Basin (WRIA # 62) I looked there first. I was surprised to see that "Agriculture/Forestry" is only 1% of the total wages in the basin. Since Ag lands are only 3% and Forest lands are 93% of the basin, I assume that most of the 1% is forestry related. Where is the rest of the forest products industry? In

manufacturing, since lumber and other wood products mills are present in the basin? I cannot believe that the forest products industry constitutes only 1% of the economy in a basin that is 93% forested. This economic data is important, because it indicates where efforts need to be focused in order to work toward solutions for 303(d) listed waters. I also suggest that the sources for the various data in Appendix A be clearly indicated, such as the population figures; who is projecting that the population of Pend Oreille is going to triple over the next 25 years?

Response: Page 2 and page 3 of the Water Quality Summaries document gives an explanation of where the information comes from. We used the best numbers we had at our disposal, with the understanding that some information we found was only by county, and extrapolations were made to fit WRIAs.

2. Page 1-5: "Nonpoint pollution is generally regarded as a land use issue." This is an accurate statement. Missing from the document is any consideration of the impact on non-point pollution of **changes** in land use. As the population data in Appendix A clearly indicates (whatever the source), Washington's population is rapidly increasing. This increase is certain to result in changes in land use over substantial areas, likely changing the types and amounts of non-point pollution (and likely increasing point sources as well). In order to be effective over time, the non-point pollution control plan must take these changes into account.

Response: We agree, but we are not sure how to make the correlation between changes and nonpoint pollution. As you are aware, monitoring and determining the cause and source of a nonpoint pollutant is extremely difficult.

3. Table 1, page 1-5. Forestry/Road construction can have an impact on water temperature due to removal of shade.

Response: Table is corrected.

4. Page 2-2: "[Forest practices] rules have been modified over time to provide what is generally recognized as the most restrictive protection found in any state in the country. ... Though change occurs slowly in the forest, the indication is that forested streams will gradually improve over time." Recognized by whom? Please provide citations or justifications for these statements and conclusions.

Response: Based on a 1991 survey of forest practices rules in other states, EPA found that very few states even had forest practices rules, and that Washington's were by far the most comprehensive and restrictive. Our conversations with the Department of Natural Resources indicate that this is still the case.

5. Page 4-3. The discussion of the Forest and Fish Report is not completely accurate. "The legislature enacted legislation (Chapter 247, Laws of 1999) which requires the Board to adopt regulations consistent with the report." This is incorrect; Section 204(1) of that law clearly states: "[T]he forest practices board is strongly encouraged to follow the recommendations of the forests and fish report, but may include other alternatives for protection of aquatic resources."

Response: The legislature directed the Forest Practices Board to adopt both emergency rules and permanent rules to Implement the Forests and Fish Report. The specific directive regarding the emergency rules was that "The forest practices board may only adopt recommendations contained in the forests and fish report as emergency rules . . ." For the permanent rules, the language does read, "[T]he forest practices board is strongly encouraged to follow the recommendations of the forests and fish report, but may include other alternatives for protection of aquatic resources." However, the section continues, "If the forest practices board chooses to adopt rules under this section that are not consistent with the recommendations contained in the forests and fish report, the board must notify the appropriate legislative committees of the proposed deviations, the reasons for the proposed deviations, and whether the parties to the forests and fish report still support the agreement. The board shall defer final adoption of such rules for sixty days of the legislative session to allow for the opportunity for additional public involvement and legislative oversight." We interpret this section to mean that the legislature expects the permanent rules to be consistent with the Forests and Fish Report, but allows for alternatives if the Forest Practices Board can show a compelling reason for a deviation.

6. The Forest Practices Board is presently conducting the environmental review required for adoption of regulations under the Forest and Fish Report. The Draft SEPA EIS for this rulemaking will contain an alternative that is more certain to reduce forestry based non-point pollution than the Forest and Fish Report recommendations. It is our contention that notwithstanding "findings" by the Legislature and an overwhelming public relations campaign by the timber industry, the report is not based on credible science, and the SEPA review will indicate the high risk to public resources from adoption of its recommendations.

Response: The purpose of the EIS is to evaluate the possible environmental impacts that would result from no action, from implementation of the Forests and Fish Report, and from implementation of a third alternative that is more restrictive than the Forests and Fish Report. Since the EIS is not completed, we cannot comment on its findings. However, we disagree with the contention that the Forests and Fish Report is not based on "credible" science. The Forests and Fish Report and the third alternative, which is a hybrid of the environmental groups' proposal and the proposal of several tribes, are based on the same science. The difference between the proposals results from different opinions of the level of risk posed by the two alternatives, based on an evaluation of the results of the same scientific information. The Forest Practices Act and the Forest Practices Board also have a responsibility to maintain a viable forest products industry.

7. Far more misleading is the statement that "In addition, assurances have been received from NMFS and EPA that the recommendations, if implemented, meet the requirements of the ESA and CWA." No credible scientists have stepped forward at either agency to claim that the Forest and Fish Report recommendations will assure compliance with the ESA or the CWA. In the case of NMFS, no such assurance can legally be given unless and until a public review process has been completed; that process will be subject to NEPA review and has not even been formally commenced. In the case of EPA, "assurances of compliance" are not within that agency's legal authority to give under the Clean Water Act, and it has been acknowledged by that agency that the Forest and Fish Report will not meet its stated goals, and is a politically, not

scientifically, based agreement: "...we do not contend that the agreement fully protects fish in forested lands, especially in the short term. And yes, there are ways that the risk to fish could have been reduced even further. ...Clearly, this is not a scientific judgment, but a political and economic one." Phil Millam, Special Assistant to Regional Administrator, Environmental Protection Agency, May 1999 "WaterTalk" Region 10 Bulletin.

Response: The National Marine Fisheries Service (NMFS), the U.S. Fish and Wildlife Service (USFWS) and the Environmental Protection Agency (EPA) were members of the group that worked on the Forests and Fish Report. These agencies have offered assurances that implementation of the recommendations of the Forests and Fish Report, which include a rigorous adaptive management process, will meet the requirements of the Endangered Species Act and the Clean Water Act. While this will require further steps to become a formal determination, it is a clear indication that the federal agencies support the Forests and Fish Report and believe it will work.

At present, the Forest Practices Board is still working on the emergency rule. It has already initiated the permanent rule, which will be adopted on or before June 30, 2001. The rules will contain the adaptive management process that the federal agencies will evaluate in making a formal determination about compliance with the Endangered Species Act and the Clean Water Act.

As we noted in our response to the previous comment, there is an array of views on the level of risk posed by implementation of the Forests and Fish Report. While there may be ways that risk to fish could have been reduced even further, the Forests and Fish Report recommends a series of restrictions that a majority of participants in the process believed would be protective of aquatic resources while allowing a viable forest industry.

8. Finally, "Funding was provided for implementing the bill," is a gross overstatement. There is inadequate funding to properly implement the Forest and Fish Report recommendations, even aside from the impossibility of determining what those recommendations mean on the ground.

Response: The Legislature has made it clear that funding the Forests and Fish Report is a high priority. However, funding must be appropriated for the program by the legislature on a biennial basis, just as it is for other state programs.

9. Page 4-5 and 4-6. The discussion of watershed analysis is incomplete. The Forest and Fish Report, Appendix G (April 29, 1999) dramatically changes how watershed analysis is used. We suggest that you obtain the report.

Response: Agree that some changes were made to watershed analysis. The section has been updated to include the changes from Appendix G of the Forests and Fish Report. The changes to WSA have been noted in the plan.

10. Page 5-30, et seq. The discussion of Forest Practices commences with a consideration of the Timber Fish Wildlife (TFW) forum that segues into a discussion of the negotiations that lead to the Forest and Fish Report. Missing from this discussion is an express recognition that the

environmental community and many if not most of the tribes abandoned the TFW forum in late 1998; TFW no longer exists and it should be so stated. The Forest and Fish Report was the result of negotiations between some of the parties who had been at the TFW table. Furthermore, the relationship of the TFW and later negotiations to the CWA should be discussed in more detail. The failure of watershed analysis to meet CWA standards was an item of constant debate at TFW for at least the last five years. Numerous documents to this effect are available from various people, including a number who are still at the Department of Ecology.

Response: The section is clear in stating that the Forests and Fish Report was proposed by "... the "5-caucus group" (county, State, and federal agencies, some tribes, and landowners)." The argument that TFW no longer exists is mostly a matter of semantics. When TFW was formed, the participants were state agencies, tribes, landowners, and environmental groups. More recently, federal agencies and counties have been included in the process. The addition of these groups did not mean that the process was no longer TFW. While we believe that the broadest range of participants possible is the best, participation in the on-going TFW process is voluntary, and the process is not negated by the withdrawal or inclusion of a particular group.

An in-depth discussion of past TFW negotiations is not appropriate for inclusion in the Nonpoint Plan. The intent here is to give an overview of current programs.

11. Page 5-32. "The DNR is developing an HCP to address the needs of threatened and declining wildlife species for all State-owned lands in western Washington and the east slope of the Cascade Mountains." This should read "is implementing" since the HCP has been in place for some time.

Response: Change made.

12. Page 5-32. "Several large private landowners are also developing HCPs which, among other benefits, will enhance riparian habitat and water quality protection." Some landowners (Plum Creek, Murray Pacific) have already had their HCP's accepted and are implementing them. The statement that they "will enhance" aquatic resources is subject to debate; it would be more accurate to say that they intend to do so as compared with baseline forest practices rules, and monitoring over time will determine their effectiveness at meeting the stated goals.

Response: The HCPs discussed in this section were designed to enhance riparian habitat and water quality. In the next paragraph, it is made clear that DNR is monitoring the implementation of these HCPs through the forest practices application process.

13. Page 5-32. "A pilot program, Landowner Landscape Plans, has been undertaken by DNR to accomplish large scale planning." This program, the last consensus product of TFW, has been effectively abandoned by the timber industry.

Response: While some of the original companies are no longer participating, three continue to actively pursue the Pilot objective. It appears that in general, the companies will rely on the Forest and Fish rules as the basic aquatic habitat and water quality protection measures. With

no final plan submitted, it remains uncertain what additional protection elements may be incorporated.

The second annual report on the Pilot will be submitted to the Forest Practices Board in December of this year. A final evaluation will be submitted in December, 2000 and is to include recommendations, if appropriate, for pursuing this approach.

14. Page 5-35. The discussion on this page leading to the conclusion: "If passed by the Forest Practices Board, the Forests and Fish Plan Report will protect key stream functions necessary for healthy fish habitat..." is subject to the same infirmities discussed above under point 5. The report is not based on credible, peer reviewed science, has not been legally given approval for provision of ESA assurances by NMFS, and has not completed required SEPA review. It is admirable that "It is the intent of the State that the practices in the Forests and Fish Report will meet the condition of salmon recovery." However, all the unsupportable conclusory statements on this page will not make it so. Please revise this discussion to reflect the correct legal status of the Forests and Fish Report recommendations.

Response: We have responded to these points earlier, but will reiterate. The recommendations of the Forests and Fish Report are based on evaluation of the same scientific information that led environmental groups and some of the tribes to propose a more restrictive alternative. The two proposals are not based on different science, but on different opinions about the level of environmental risk posed by implementation of the Forests and Fish Report. Federal agencies have given as much assurance as they can at this point in the process, that they believe implementation of the Forests and Fish Report will result in compliance with the Endangered Species Act and the Clean Water Act. Formal assurance will require additional steps, such as a 4(d) rule, by the federal agencies. SEPA review is currently in progress for the permanent rules.

Comments received from Ann Goos, Director of Environmental Affairs, WFWA

1. We strongly assert that the anticipated improvement in the forest practices rules and regulations as supported by the Forests & Fish Plan need full and complete description in the Nonpoint Source Management Plan. We also want to support the position (along with the federal and state agencies, including NMFS, USFWS, and EPA; many of the Tribes; counties; and small and large landowners) that the Forests & Fish Plan addresses the concerns that have been previously expressed by NOAA and EPA in their analysis of Washington state's Forest Practices program. The following are our suggested improvements to the Nonpoint Source Management Plan:
2. **Page 4-3 – Section describing the Forests & Fish Report**
Suggested language for the third sentence, first paragraph, on page 4-3:

The Forests & Fish Report, dated April 29, 1999, has been submitted to the Forest Practices Board. Following the Forest Practices Board meeting of September 29, 1999, the DNR and the Board drafted emergency rules consistent with the Report and the emergency rules will be out for public review, following the filing with the state code reviser, by October 20,

1999. The Board is expected to take action on November 16, 01999 on the proposed emergency rules that are consistent with the Forests & Fish Plan. Permanent rule making by the Forest Practices Board has also started and the Forests & Fish Report was selected as the Board's preferred alternative on March 31, 1999 to help focus SEPA EIS analysis.

Response: Updated schedule has been included.

3. In the same paragraph on page 4-3, you need to add the USFWS to the list of federal agencies providing assurances under the Plan. USFWS is also expected to issue a 4(d) rule for bull trout as a result of the Forests & Fish Plan and are willing to provide assurances for six stream breeding amphibians.

Response: USFWS has been added.

4. Also in the bulleted section on page 4-3, describing the Streamside Management Areas, WFWA suggests that you add in a sentence or two describing that the goal of the streamside management areas is to create riparian conditions that will meet the stand characteristics of a mature riparian forest at approximately 140 years of age. The attainment of resource objectives for fish bearing streams includes protections for stream temperature and producing adequate levels of large woody debris and nutrients, such as detrital material, to meet habitat objectives. The buffers will also reduce sediment and protect streambanks. (A logical placement of the suggested sentences would be at the beginning of the paragraph to help set the goals for the descriptions of the different buffer zones – no touch, inner, and outer – that follow in your draft).

Response: Language was included.

5. In the bulleted section describing the Streamside Management Areas on page 4-3, WFWA suggests you must add the following language to reflect the protection measures for non-fish bearing streams:

Protection measures will also be provided to non-fish bearing streams as they are considered waters of the state (if perennial), and can deliver water, organic matter, and sediments to fish habitat. Non-fish streams will fall into two categories: perennial and seasonal. Perennial non-fish habitat streams will have a 50-foot wide no management buffer on each side of the stream for at least 50% of their length. The buffering could increase up to 100% where sensitive sites such as perennial seeps, springs, unstable inner gorge slopes, alluvial fans and perennial stream intersections occur. All sensitive sites will receive buffering to protect perennial waters and amphibian habitat. A 30-foot equipment limitation zone on each side will border any remaining perennial and all seasonal non-fish habitat streams. This zone is designed to preserve streambank vegetation, prevent bank erosion and significantly limit the potential for sediment delivery to the streams. The eastside non-fish habitat stream protection will be equal to the westside strategy but will allow for a continuous buffer for the entire stream length with limited entry.

Response: Language added, except for the (if perennial) in line two. Waters of the state also includes intermittent streams.

6. In the paragraph on the bottom of page 4-3 starting with the sentence “(A)dditional efforts will be focused on identifying and protecting unstable slopes and providing”, WFWA suggests the following language must be added:

Additional efforts will be focused on identifying and protecting unstable slopes, improvement in the classifications of and protection for streams to include streams that have the potential for fish presence once the instream and habitat conditions have recovered, pesticide applications, wetland protections, watershed analysis, and development of alternate plans that will provide public resource protection equal to the standard Forests & Fish Report. In addition, the Report recognizes that current scientific knowledge falls short of providing firm answers to all of the water quality and fish habitat resource questions. Specific technical research projects are listed in the Report and an adaptive management process is recommended for completing those projects. The process includes planning, budgeting, and project management along with technical and policy review and dispute resolution. The recommendations place final authority in the hands of the Forest Practices Board, with federal agency oversight to determine whether the Board is responding to the new scientific findings.

It is critical that the adaptive management portion be included in this section as this is the most important element of the Forests & Fish Report for the federal agencies, including EPA. We also believe that one of the major criticisms EPA has had regarding our State's forest practices has been lack of protection for perennial non-fish bearing streams. Inclusion of the suggested language above will help ease EPA's and NOAA's concerns as stated in 1995.

Response: Language added

7. Section 5 – Forest Practices pp 5-30 through 5-61

Description from Federal Guidance section – Suggested Improvements

WFPA suggests you add the following to the last sentence in the first paragraph under this subsection on page 5-30:

Many of the largest national and international corporations have operations and corporate headquarters in the State.

Response: Language added.

8. In the paragraph describing TFW, WFPA suggests the following language be inserted after the first two sentences in the paragraph, and before the third sentence on page 5-32:

TFW provides a framework, procedures and requirements for successfully managing the State's forests so as to meet the needs of a viable timber industry and at the same time provide protection for public resources; fish, wildlife, and water as well as the cultural/archeological resources of Indian tribes within the State of Washington.

Response: Language added.

9. In the fourth paragraph, second sentence in the parenthesis on page 5-33, WFPA suggests the following edit:

(county, State and federal agencies, including EPA, NMFS, and USFWS, many of the tribes and landowners)

Response: Language added.

10. In the same paragraph on page 5-31, WFPA suggests the following language be added to the end of the paragraph:

The Forest Practices Board has been directed by the Legislature to implement the Forests & Fish Report as emergency rules. The Board has currently forwarded substantive emergency rules to the public that are consistent with the Forests & Fish Report and the Board anticipates a final decision on November 16, 1999. Training for the new emergency rule package will be conducted in late December and early January and the effective date for implementation of the new emergency rules is late January 2000. Permanent rule making has also started and the Forests & Fish Report is the Board's preferred alternative to help focus the development of the SEPA EIS on the permanent rule package.

Response: Language added, but should read as follows: The Forest Practices Board was directed by the Legislature to adopt emergency rules consistent with the Forests and Fish Report. The Board has drafted the emergency rules, received public comment, and expects to adopt the emergency rules on January 20, 2000. Training for the new emergency rules will take place in February and March, 2000. The effective date of the emergency rules is March, 2000. Permanent rule making has also started, and the Forests and Fish Report is the Board's preferred alternative for development of the environmental impact statement required under SEPA for permanent rule adoption.

11. In the eighth paragraph on page 5-31, WFPA strongly suggests that the following language must be added to this paragraph:

The Forests & Fish Report anticipates a substantive adaptive management program to accompany the new protection measures. The program includes the defining of performance goals, resource objectives, and performance targets to help guide research. In addition, there will be funding for the program to establish and implement compliance, validation, and effectiveness monitoring. Research questions have already been crafted and federal funding is already being authorized for the new research and monitoring programs.

Response: Language added, except for the third sentence of the comment, which should be changed to read, "In addition, we anticipate funding for . . .".

12. A list of list of key questions and the anticipated monitoring/research needs are displayed in Schedule L-1 of the Forests & Fish Report. We strongly suggest that DOE may want to list these in the Nonpoint Source Management Plan. This would give EPA and NOAA a much more complete understanding of the scope and scale of research anticipated under the Forests & Fish Plan.

Response: While the key questions and research needs are very important for successful implementation of the Forests and Fish Report, It is not necessary to list them in the Nonpoint Plan, which is intended to give an overview of programs.

13. In the ninth paragraph on page 5-31, WFPA suggests you may want to add language explaining that the Watershed Analysis process was designed to address the cumulative effects of forest

practices in a watershed. Cumulative effects are defined as “changes to the environment caused by the interaction of natural ecosystem processes with the effects of two or more forest practices”.

Response: Language added. This is the definition of “cumulative effects” in the forest practices rules.

14. In the first full paragraph on page 5-32, WFPA suggests the following edits to ensure accuracy with the reporting to NOAA and EPA. The DNR has completed its 1.6 million acre HCP on state trust lands, though only the westside portion specifically addresses aquatic species and fish habitat protection. The state HCP was approved by the Board of Natural Resources in 1996 and is currently being implemented. The description of the State DNR HCP should be added to the list of completed HCPs as described in paragraph two on the same page. You might want to add in the first full paragraph that at least three forested HCPs, with specific aquatic habitat protection measures, are currently in negotiations including the Simpson HCP that is specifically addressing water quality issues and CWA compliance.

Response: We have included discussions of DNR's and private HCPs.

15. To be sure that the EPA and NOAA fully appreciate the additive quality of protection measures for water and fish habitat in forested watersheds, WFPA suggests it would be advantageous to provide the federal reviewers with more detail regarding the completed forested HCPs. Every one of the private HCPs has significant buffer protection for both fish bearing and non-fish bearing streams and specific protection measures for unstable slopes and road construction and maintenance. The following are HCP descriptors that WFPA strongly urges DOE to add into the Management Plan document:

Murray Pacific HCP – this 100 year multi-species HCP covers 54,610 acres in Lewis County in SW Washington. The conservation strategy for aquatic habitat includes:

- Watershed Analysis will be conducted on more than 98% of the 54,610 acres.
- Stream restoration measures;
- Wetland surveys and monitoring peak stream temperatures; and
- Detailed road inventories to address mass wasting and surface erosion in the watersheds;
- Habitat reserves will be established on 10% of the vegetated land;
- Retention of snags, downed woody debris, minimizing soil disturbance during harvest in forested wetlands, keeping skid trails and ground-based yarding systems to a minimum in forested wetlands, and harvest in a pattern to promote and maintain dispersal habitat for birds;
- Monitoring to verify and validate the effectiveness of the HCP conservation measures.

Port Blakely HCP – this 50 year multi-species HCP covers 7,486 acres in Grays Harbor and Pacific County near the SW coast of Washington. The conservation strategy benefiting aquatic habitat includes:

- Adjusted harvest levels to accommodate a wider range of forest successional stages

- benefiting fish and wildlife species;
- Special management practices to better enhance habitat;
- Protecting stream areas. Techniques to address unstable slopes, surface erosion, stream shading, and other factors crucial to stream habitat spelled out in the Port Blakely mitigation measures approved by NMFS and USFWS;
- Special protection measures for marbled murrelets, spotted owls, and northern goshawks;
- Two-part monitoring plan. First, compliance monitoring to evaluate and document the company's performance under the plan and second, effectiveness monitoring to determine how well these conservation measures work.

Plum Creek HCP – this 50 year multi-species HCP covers 418,690 acres in the central Cascades of Washington state. The conservation strategy benefiting aquatic habitat includes:

- Riparian Habitat Area (RHAs) designation and protection is a corner stone of the HCP. RHAs and associated wetlands account for 12,000 acres of the Plum Creek HCP;
- A five part mitigation strategy has been designed for the RHAs:
 - Maintain stable stream channels and the natural functioning of the physical stream processes;
 - Allow for adequate accumulation of large woody debris in stream channels;
 - Provide adequate vegetation to minimize pollution from up-slope activities and maintain adequate stream shading;
 - Provide adequate nesting, roosting, and foraging and dispersal habitat for spotted owls;
 - Maintain a diversity of riparian habitat for riparian dependent life-forms.
- Additional mitigation measures include watershed analysis on 20 watersheds within the first five years of the plan.
- Further conservation measures include maintaining a diversity of stand structures, protection of special habitats, and curtailing yarding activities in sensitive areas;
- The monitoring commitment will include yearly habitat verification on stand structures, life-forms, and surveys for amphibians to adaptive management techniques as necessary.

Response: These recommended descriptions have been added.

16. Though this is a lot of information to add into your Nonpoint Source Management Plan, WFPA believes it is crucial to demonstrate to both EPA and NOAA that in addition to the new Forests & Fish Plan, individual forest landowners are working with the federal agencies to implement improved and federally approved forest practices benefiting aquatic habitat throughout the state. The roughly 480,000 acres now under approved private HCPs to address ESA concerns, plus the completed state HCP covering 1.6 million acres, plus the additional HCPs being completed by other forest landowners, should help the federal agencies recognize how significant the protection for aquatic habitat and water quality is in this state's forested environment. When one adds in the protection measures being employed on all national forests in this state, the "cumulative effects" of all forest practices designed to protect riparian habitat is quantitative and qualitative and arguably, the best in the country.

Response: While these efforts are all important, the Nonpoint Plan is intended to provide only

an overview of programs.

17. On page 5-32, in the first paragraph under the heading “Nonpoint Pollution Associated with Forest Practices”, we are confused by the limited amount of information DOE is stating is available on individual stream segments. WFPA is not sure what you are defining as “recent studies on forested streams” but we suggest the list of two (Nooksack and White River) is inadequate and grossly under reports ongoing monitoring and research being conducted for water quality and aquatic habitat on forested streams throughout our state. We suggest contacting the Center for Streamside Studies at the University of Washington for any information they might have regarding studies in forested watersheds. WFPA will also try to get a more complete list of studies and submit in time to meet your public comment period.

Response: The reference to the Nooksack and the White River have been deleted. The focus of the paragraph was to make the point that improper forest practices are known to cause detrimental effects on water quality.

18. On page 5-33, in the second full paragraph on the page, WFPA suggests you may want to add in a sentence or two describing the civil penalties that can be imposed by the DNR to landowners who are not in compliance with forest practices. WFPA suggests that you briefly describe the enforcement capabilities of the DNR and the ability to assess up to \$10,000 for each violation of forest practices rules and regulations. Please see Chapter 222-46 of the Forest Practices Act for a more complete description of enforcement capabilities to ensure compliance with forest practices.

Response: Language added.

19. On page 5-35 under the heading “Description of Current Programs in Washington”, the following edits are suggested. In the third paragraph describing the Forests & Fish Report, WFPA again suggests that you must add in the USFWS into the list of federal agencies already providing assurances. The USFWS Regional officials plan to approve the Forests & Fish Report as meeting requirements under the ESA for bull trout and six stream breeding amphibians.

Response: This section has been rewritten to more thoroughly describe assurances from federal agencies.

20. On page 5-35, in the fourth paragraph describing the goals of the Forests & Fish Plan, please add in language that reflects that the riparian strategy includes protection measures for both fish and non-fish bearing streams. Please be sure to always describe the riparian strategy as protecting all perennially forested streams and equipment limitations on seasonal streams so that EPA and NOAA appreciate that all forested waters of the state are now buffered adequately to meet water quality standards.

Response: Language to this effect has already been added to the section on Streamside Management areas, per comment #5, above.

21. On page 5-37 - 57, under the heading “Management Measures”, WFPA is interested in how

DOE is approaching describing current management measures. First, DOE needs to be sure that the current emergency rules based on a 100 foot SEPA trigger for all forestry related activities within ESA listed geographic areas is clearly displayed in all of the sections describing forest practices rules i.e., timber harvesting activities. You have included the current emergency rule language in some of the sections, but not all. This should be corrected to adequately describe current emergency rules that have been passed by the Board and enforced by the DNR. Also, the Forest Practices Board voted on a new emergency rule package, implementing the Forests & Fish Report, on September 29th. How is the DOE going to treat the new proposed emergency rules? It is critical that EPA and NOAA fully appreciate the new protection measures – as agreed to by NMFS, EPA, and USFWS – will be in effect within weeks of the submittal date of the Nonpoint Source Management Plan. Given the two agencies' comments from 1995, it is important for any description of current programs in Washington State to fully disclose current rule making processes including emergency rules implementing the Forests & Fish Report and the permanent rule making process.

Response: Ecology has made clear the fact that forest practices emergency rules are currently being drafted, and are expected to be adopted on January 20, 2000. Further discussion of the questions raised in this comment is not needed as part of the Nonpoint Plan.

22. On page 5-60, first full paragraph on the top of the page. Again, it is critical that the non-fish bearing stream strategy of the Forests & Fish Report be described in this section (please see page 2 of our comments). Additionally, you need to be sure to describe the regional approach to the fish and non-fish bearing stream protection measures to address ecological differences between western and eastern Washington. It is important that language is added in this section to make sure that NOAA and EPA understand that the new protection measures in the Forests & Fish Report are specifically aimed at addressing all of the problems stated in the previous section starting on page 5-58-59. For instance, the new pesticide rules in the Forests & Fish Report directly addresses the concerns raised in studies assessing BMP effectiveness. The new riparian protection measures are designed to provide adequate levels of detrital inputs, water temperature, stream bank stability, sediment loadings, and LWD recruitment. It is vital for DOE to connect the perceived inadequacies of the 1995 measures to the protection measures that will be required under the Forests & Fish Report. In this manner, EPA and NOAA understand that the new forest practices are specifically aimed at improving the stated problems and will protect both numeric and narrative water quality standards.

Response: Ecology believes this section adequately describes the new measures proposed in the Forests and Fish Report.

Comments received from Robert Meier, Manager, Technical Services, Rayonier

1. As active participants in the Forests and Fish Report negotiations we strongly support the report and encourage you to fully recognize the tremendous contribution of Forests and Fish and the soon to be implemented emergency Forest Practices rules in reducing nonpoint source pollution in Washington State. Dr Dieu (Rayonier's geomorphologist) participated actively in the development and review of the Unstable Slopes and Roads appendixes of the Fish and Forest Report. I strongly encourage you to incorporate a robust discussion of these aspects of the Forests and Fish Report. These two appendixes are every bit as substantial and important to

clean water as the riparian aspects of the report.

Small Private Landowner Technical Assistance Service:

1. Page 8: The assertion that "forestry" is the sole source of coarse sediment from landslides is not correct. Much of urban and suburban land clearing and development are also responsible for many of the mass failures we have seen around the state, e.g., Kelso and lot of bluff properties on Puget Sound.

Response: Language should be adjusted. Forestry may be a primary contributor, but is unlikely to be the sole source.

2. Page 11: Second paragraph; "Local governments play an extremely important role by passing ordinances that control land use." This is very true. The DNR Urban and Community Forestry (U&CF) program works with many developing communities in the formation of their ordinances dealing with natural resource preservation and management. Currently, the U&CF program is federally funded. The plan should state that with state support we could increase our education and outreach efforts to assist communities further.

Response: Comment noted, thank you.

3. Page 11: Third paragraph; "Urban areas are the third...land coverage." The plan should also mention that urban areas are more than likely the only land use experiencing rapid growth. In fact, urban growth is probably 'swallowing up' forest, cropland, and livestock lands.

Response: Language added.

4. Page 14: Third recommended action; "Educate small landowners..." DNR Forest Stewardship Program currently works with many non-industrial private forest owners to develop long-term stewardship management plans for their property. The Forest Stewardship program is partially funded by USFS funds which are perennially at risk of cuts by federal legislators. Sustainable state support of this program would help ensure that those relationships are alive, and that forest stewardship education continues for a large segment of Washington landowners.

Response: Comment noted, thank you.

5. Page 14: Fourth recommended action; "Evaluate opportunities to purchase..." The DNR Legacy program is currently cooperating with USFS and the Mountains to Sound Greenway on conservation easements to protect the I-90 corridor. Development of additional land conservation organizations like Mountains to Sound would be beneficial to help with the coordinated management of these "at-risk" areas.

Response: Comment noted, thank you.

6. Page 15: Second recommended action; "Encourage cities.." The DNR U&CF program is currently working with many cities to fund tree planting projects. U&CF also educates cities and

individuals on the importance of planting trees.

Response: *Comment noted, thank you.*

7. Page 15: Third recommended action; "Develop incentives..." The plan only refers to preserving riparian areas as "natural buffers." Working with communities to develop incentives for municipalities and land developers in preserving a lot more of the tree canopy when they are developing these new areas should be emphasized.

Response: *Comment noted, thank you.*

Comments received from Selden Hall - DOH

The narrative portion of the plan in Section 5, dealing with on-site sewage is basically accurate and the only comment we have on that is the Description from Federal Guidance, p. 5-96. What is the source from which this statement is drawn?

In the recommendations on pages 5-94 and 5-98, we have the following comments:

1. The statement "Expand the use of MOAs with local governments to address the needs for expansion of sewer services to areas of actual or projected high population density." DOH suggests this be clarified by striking "with " and interjecting "between Ecology and". This change would support the Ecology role in sewer projects.

Response: Change made as suggested.

2. The third bullet on page 5-94 should reference the Northwest On-site Wastewater Training Center (NOWTC) instead of the WSU Cooperative Extension. (The NOWTC facility is located at, but not a part of, WSU Extension center in Puyallup.) Also, striking the "homeowner" qualifier will allow a broader approach to O&M-focused educational programs.

Response: Change made as suggested.

3. First bullet under recommendations on page 5-98: The recommendation as stated puts emphasis on local health to perform inspections. As local jurisdictions are routinely inspecting permitted new and repair installations, this recommendation appears to target inspection of existing on-site sewage systems. This latter type of inspection is only part of a comprehensive approach to O&M. Therefore DOH would assert that it may be a more appropriate and effective to place resources in an Operations and Maintenance program. DOH suggests that the two recommendations on this page be combined to say: Identify the needs and seek additional funding for local health jurisdictions to augment the development and implementation of local Operation and Maintenance programs.

Response: Change made as suggested.

Comments received from Bob Woolrich - DOH

First, I have a general comment. In several places, I think the words “fecal coliform” should be replaced by “fecal contamination.” The indicator organism is fecal coliform, but the problem is fecal *contamination*, which is a much bigger problem than just fecal coliform. Below, I have noted a few places where I think this change is needed, but perhaps a quick review of the document would expose other places.

Regarding publication #99-26

Page 1-4, Shellfish Growing Areas. (I assume that the table lists the reasons that the Department of Health has closed or restricted commercial and recreational shellfish harvests. If not, my comments may not be altogether appropriate)

1. I suggest that throughout this discussion you replace fecal coliform with “fecal contamination.” As stated above, restoration activities have reopened about 13,000 of the 46,000 acres.

Response: Changes made throughout the document.

2. I agree with your first two listings in the table, but the third listing should be “Stormwater from suburban development.” I suggest deleting the listing of pet wastes and including it in “stormwater from suburban development.” DOH has not identified fecal contamination from pet wastes as being a significant source in any growing area.

Response: Change made as suggested.

3. Lawn fertilizer and pesticides may keep molluscan shellfish from reproducing or thriving, but we have not closed or restricted areas for these reasons. I would suggest deleting it.

Response: Row was deleted.

4. I would list *Wildlife* as the fourth nonpoint source listed as causing closures. Typically, we don’t have any control measures that we can implement to control fecal contamination from wildlife, but in two areas wildlife has been identified conclusively as the primary source. I think we should be candid about this.

Response: Fecal contamination from wildlife was added.

5. I would suggest that the last two table items be clumped together. In some places, campers, hunters, fisherman, and boaters do not have adequate access to toilet facilities. I would not single out boaters.

Response: We kept both categories. The purpose of doing so is to show the increasing problems from nonboater recreation. The intent is not to single out boaters.

6. Pages 2-2 and 2-5. Here again, I suggest replacing “fecal coliform” with “fecal contamination.”

Response: Changes made

7. Page 4-9 Shellfish Closure Response Plans, paragraph 3. Health, Ecology, and the Puget Sound Action Team initiate a closure response plan.

Response: Change made

8. Page 5-89, first sentence of last paragraph. Local health jurisdictions (LHJs), not the State Department of Health, are responsible for permitting on-site sewage systems less with flows of 3500 gallons per day or less. The State Department of Health or the LHJ is responsible for permitting systems between 3500 gpd and 14,500 gpd.

Response: Changes-made as suggested.

9. Page 5-90, first sentence, second paragraph. I do not believe that DOH and the LHJs think that the *primary* focus for the on-site sewage programs is to restore and protect shellfish beds. On-site sewage programs have to protect drinking water, recreational waters, shellfish growing waters, and keep the public from being directly exposed to untreated sewage. Protecting shellfish growing waters is *one* of the focuses.

Response: Changes made to clarify purpose of on-site programs

Regarding publication #99-26, Appendix A

10. Page 38 Elwha/Dungeness Basin. The projected population trend graph does not appear to be consistent with the first sentence. I think that the stated 179,184 people should be 79,184 people.

Response: Figure corrected.

Comments received from Fred Michelson, Olympia, WA

1. I see nothing in this document that creates the DOE police and I mean get tough enforcement in new uniforms of large teams in the state regions in new trucks that show up unannounced ready to inspect every facet of the administration as well as the policy, plans, and science being applied to anti degradation, and pollution control measures by all sources of expected environmentally hazardous runoff and contamination. The counties are not able to perform such voluminous enforcement.

Response: We tried to balance enforcement with education and assistance (both financial and technical). Education and assistance have always been more politically palatable as a means of making effective change in environmental quality. There is some movement toward increased enforcement, especially with dairy waste and actions to try and solve the salmon dilemma. However, I doubt if you will ever see uniformed environmental cops in this state.

2. The plan says on page 9-31, to have WDFW do its enforcement thing with marine detachments and increase hydraulic code enforcement. I'm not sure who wrote this, but obviously they don't know that WDFW has even less staff than the handful of DOE enforcement types.

Response: Your right, budget shortfalls have created an inability to do what we would like to in regards to water quality. There are so many needs, and so little money.

Comments received from David Taylor, Kittitas County Planning Department

1. Due to the short timelines for commenting, Kittitas County will only provide general comments based on our brief review of the management plan. It would appear that much of the focus to control nonpoint source pollution is on agriculture and forestry. It should be noted that counties are required to designate and protect resource lands of long-term commercial significance under the GMA (RCW 36.70A), including agricultural and forest lands. We find it interesting that since this requirement was placed on counties in 1990, state agencies have continuously attempted to place new, overly burdensome and, at times, legally questionable regulations on these lands. Once again a state agency, in this case the DOE, is attempting to adopt a management plan that includes implementation strategies that could place higher and overly burdensome requirements on agriculture and forestry operations. This is unacceptable to Kittitas County.

Response: This plan does not place undue burdens on any one source category. All categories were treated in the same manner; that is, source control programs were critically viewed for ability to minimize impacts on the state's waters. The fact that agriculture and forestry are the largest contributors of nonpoint pollution may give the perspective that they are being singled out, but that is not the case. This plan presents a fair and respectful process of all sources of nonpoint source pollution. A thorough reading of this plan will make that apparent.

Comments received from Beverly Isenson, Governor's Council on Environmental Education

1. GCEE is now taking the lead on Education 15, Develop and Implement education/outreach and volunteers strategy.

Response: Change made to reflect GCEE as lead for Ed15.

Comments received from Josh Baldi, Washington Environmental Council

1. As noted in the Executive Summary, the draft plan is a "statewide look at protecting the state's natural resources from nonpoint pollution," and is "a collaborative effort" of many entities. While the draft plan and related documents do a fine job of presenting the various nonpoint

programs and efforts, we believe it would be more effective for the state to articulate a cohesive and comprehensive strategy designed to restore water quality to Washington's waters. The state readily acknowledges the shortcomings of the existing approach as illustrated by the following excerpts: (4 excerpts noted)

Put simply, we do not believe that the draft plan, as currently structured, will accomplish water quality standards in any foreseeable future.

Response: Comment noted

2. We believe there are viable ways for the state to begin exploring and realizing such a plan (cohesive and comprehensive strategy). For example, the state could define an overall approach and protocols for monitoring and adaptive management. The state also could make immediate improvements to existing tools, notably the HPA and SMA rules. At the very least, the state could articulate the funding obstacles that are likely to prevent success. For example, funding shortfalls are anticipated to create a significant backlog for plan implementation as required by the Dairy Nutrient Management Act by 2003. Moreover, the state is already off pace from the requisite TMDL schedule. Being forthright about these and other funding needs will be a basic requirement of any successful strategy.

Response: We agree that more can be done, however, given the history of nonpoint control efforts in the state, we believe this is a good start. At the end of Chapter 1 we clarified the next steps, including the need to be open for adaptive management.

In Chapter 11, page 11-2, first paragraph, we clarified funding obstacles that included available dollars and lack of guarantees.

3. As noted in the draft plan, a "Water Cleanup Plan, or TMDL, is a common-sense, science-based approach to cleaning up polluted water so that it meets approved water quality standards." We fail to see why the state is not embracing this approach as the logical driver for a cohesive and comprehensive water quality restoration strategy, particularly in light of the 15 year settlement agreement. References to the agreement and related efforts seem to be included as an after thought to the draft plan; there simply seems to be a reluctance to place existing efforts within the TMDL context.

Response: TMDLs are a common sense approach, but not the only one available as a management tool. This plan is intended to be a tool box that can be used for TMDL implementation. We recognized straight away that having one overarching management activity does not make sense, nor could it be embraced, by a state with such a diverse populace.

4. The state has numerous tools at its disposal through which to articulate and implement a successful water quality restoration strategy. However, these tools must be better utilized, and in some cases, improved to achieve this objective.

Response: We agree. There are numerous tools at our disposal, many of which are not fully utilized. One of the first efforts after this plan is approved is to break it down into a toolbox to

be used at both the local and state levels.

5. There clearly are areas where the state is in need of statutory changes to adequately address some of the challenges (example given p 5-148). However, rather than seeking statutory changes to correct this deficiency, the state is now embarking on the risky proposition of a programmatic HCP to cover HPA issuance (p. 5-169). Granted, the Hydraulic Act falls under the jurisdiction of the Department of Fish and Wildlife. The example merely points out that the state as a whole is failing to utilize and improve upon existing tools and that collaboration with sister agencies should be integrated into the strategy.

Response: We agree. On page 8-4 we identify workgroups. The state agency workgroup has been formalized. Director Fitzsimmons has written to other state agencies involved with nonpoint source control and asked for representatives. It is visioned that this workgroup will cooperatively approach nonpoint source control.

6. In situations where the state is more optimistic about making changes to existing approaches, such as agricultural practices, changes fail to provide the certainty that is needed to achieve water quality objectives....We would urge the state, either through its water quality strategy, or through the Salmon Recovery Plan, to define the defaults that will take effect should the voluntary programs fail to meet water quality objectives.

Response: We expanded the "Measuring Success" table on page 12-5. We added a milestones column next to each performance measure. We will use milestones as our starting place to determine whether the plan is working and water quality is improving. In the event that milestones are not reached, we made it clear that we will adapt (adopt) new measures.

7. In regards to the stated assurances from NMFS and EPA that the Forest and Fish Report meet the requirements of the ESA and CWA (p. 5-37): Contrary to the confident tone, the first statement is simply inaccurate as EPA has withheld assurances pending the outcome of funding decisions and other issues. Moreover, it is questionable whether EPA has the legal authority to offer such assurances. NMFS ability to grant such assurances is subject to NEPA review, which has not been formally commenced.

Response: See response to Toby Thaler's #7 on page 8. He stated the same concern

8. A final theme that undergirds and is implicit in the above mentioned concerns, is the need for greater accountability throughout the entire draft plan. While many of the outputs and outcomes will give us a general indication of our progress toward improving water quality, or lack thereof, additional measures are needed. Were the plan to embrace a TMDL strategy, such accountability would be institutionalized.

Response: We agree and drastically enhanced the performance measures table in Chapter 9. Once the state develops a statewide monitoring strategy for nonpoint pollution, even greater indicators can be developed.

9. WEC believes it is imperative that additional and clearer timelines and default actions be

defined.

Response: See response to comment #6

Comments received from David G. Jennings - Source Water Protection Program Manager, Department of Health

1. We have concerns about how ground water quality data was presented in relationship to drinking water. In particular we would like to offer substitute language for the following sentence that occurs in both the Executive Summary and the full document:

“Statewide, violations of the 10 mg/l nitrate-nitrogen drinking water standard (public and private ground water supplies) are estimated at 10-15 percent, with a few areas as high as 20-25 percent.”

There are several problems with this sentence. First, private (single family domestic) wells that exceed the nitrate standard do not violate the standard, they exceed it. The word “violation” is a technical term that implies enforceable standards. Drinking water standards only apply to regulated public water systems.

Second, it is inappropriate to lump public and private drinking water wells together and discuss them as a class. With how it is characterized above, one could easily infer that 10-15 percent of people drinking from wells consume water that exceed / violate the nitrate standard. This is not true. We have a relatively small number of public water wells that have nitrate concentrations > 10 mg /l nitrate-nitrogen.

The approach used in the Unified Watershed Approach was to look at the percent of public water wells that exceeded ½ the nitrate standard (5 mg/l) as an indicator of deteriorating ground water quality. We are more comfortable using this assessment criterion if public water sources need to be included as ground water quality indicators.

Single family domestic (private) wells are classically at higher risk from nitrate contamination than municipal wells. Private wells are typically more shallow relative to their municipal counterparts and are often located in closer proximity to potential contaminant sources such as septic tanks, agricultural areas or concentrated animal operations. The statewide percentage of private wells exceeding the nitrate standard may well be 10-15 percent as referenced above, but DOH lacks sufficient statewide data to support this figure. We assume that Ecology has the data to make this assertion. We do concur that in certain parts of Washington State, nitrate contamination of ground water is a regional problem that impacts upwards of 20 percent of single family domestic wells.

We suggest that the following sentence be substituted:

Statewide, exceedances of the 10 mg / l nitrate-nitrogen drinking water standard in private / domestic wells are estimated at 10-15 percent, with a few areas as high as 20-25 percent.

Combining public and private drinking water wells only adds uncertainty. The main message is that private drinking water wells are an excellent “ambient ground water” assessment tool and the

finding from these wells is that a high percentage exhibit degraded water quality—primarily as a result of nonpoint sources of pollution.

Response: Change made in both the abridged version and in the full plan. We also added your language on page 2-7 that, "Single family domestic...." That discussion is important and needs attention.

3. There is a sentence in the main document (page 2-7): *Low levels of pesticides were detected in six percent of a subgroup (1,103) of the 1,326 wells.* As written this sentence is not clear. It may be better written as:
Low levels of pesticides were detected in approximately six percent (66) of a subgroup (1,103) of these wells.

Response: Change made as suggested

4. In addition, the report uses both 65 and 70 percent of drinking water supplies come from ground water. This is a difficult number to quantify. Traditionally we have estimated the percentage to be 65%. We suggest you standardize on the 65 percent value.

Response: Change made

5. Under Recommendations by Category / Agricultural Activities / New Program Development, AG 3 reads: *"Expand well water protection program in areas with moderate to high potential for contamination."*

DOH's wellhead protection program, to which this refers, is a mandatory program statewide. This being the case, AG 3 as written, does not make sense since there is no expansion necessary. What may be necessary is for regulatory agencies such as Department of Ecology and Department of Agriculture, and technical assistance providers such as the Natural Resources Conservation Service and the Cooperative Extension Service to expand THEIR use of the wellhead protection findings in order to prioritize where to focus technical support and compliance inspections.

Response: AG 3 changed to reflect your comment.

6. In the Urban Activities, Pollution Prevention section Urb23: *Develop and implement a water restoration template for use in watershed plans under chapter 90-82.RCW*—It was our understanding that this is primarily focused on water quantity issues and may not be directly applicable to nonpoint source pollution control.

Response: 90.82 is primarily focused on water quantity, however, all planning units are encouraged to plan for and implement water quality and habitat issues. This recommendation comes from the salmon strategy.

Comments received from Chris Parsons, Dept of Community, Trade, and Economic Development

1. Page 3-9. The first bullet and other references on this page should refer to urban growth areas (UGAs) for counties and delete the acronym UGMA (this is not a term referenced in the GMA).

Response: Done

2. Page 3-9. Insert a copy of the last paragraph on page 5-66 that reads in part: “Under the GMA, those local governments fully planning under the Act...” on page 3-9 after the sentence, “The UGA should permit urban densities and include open space and greenbelts”.

Response: Done

3. Page 3-9. The third full paragraph stating “Jurisdiction that do not meet GMA deadlines...” should be revised. We suggest the following changes:
“Jurisdictions that do not meet GMA deadlines or are found by the Growth Management Hearings Board to be non-compliant with the GMA become ineligible for certain state grant and loan programs, including the Public Works Trust Fund, Community Economic Revitalization Board funds, Centennial Clean Water Fund, or any state grant or loan program that funds capital facilities projects.”

Response: Revisions made

4. Page 5-79. The second paragraph under Description of Current Programs in Washington should be revised to delete “and protection”. CTED’s WAC guidelines only provide guidance for the designation of critical areas, not protection.

Response: Deleted

5. Page 5-80. The Additional Needs section should delete: “There is no compilation of critical areas”. Also, the Recommendations section should delete: “Map all environmentally sensitive areas in the State on a single GIS database”.

While local governments are required under RCW 36.70A. 172 (1) to include the best available science in developing policies and development regulation to protect the functions and values of critical areas, they are not required to require to compile or map all critical areas. They are required, although, to adopt designation criteria that can be applied to development actions that impact critical areas. To require local government mapping of all environmentally sensitive areas in the state is both expensive and found not to be reliable for permitting purposes. The designation criteria provided under WAC 365-190-080 does not include protection criteria under the GMA.

Response: Deleted

6. Page 7-18, Watershed Restoration Action Strategies. This section omits any mention of land use management responsibilities under the GMA as a strategy for implementation of watershed restoration. For watershed management and restoration to be successfully implemented, a local

government must provide certainty through a regulatory implementation strategy including the development of land use designations through zoning, critical area protection, and capital facilities infrastructure funding.

Response: Added to the discussion your point that if implementation activities are going to happen successfully in this state, they must happen at the local level, with local buy-in and support.

Comments received from Cindy Moore, Dept of Agriculture.

Note: comments were based on the contributors review draft

1. If Volume 3 of the Nonpoint Management Plan is going to be a stand-alone document, it will need some more descriptive information in the beginning of the document to aid the reader. It will also need something like an executive summary that references volumes 1 and 2 as well as the comprehensive document (public review draft). In addition, there are many grammatical and punctuation errors in the document. We did not take the time to identify them but suggest that a technical writer review this document.
2. Chapter 1, page 4: The table just below "Drinking Water/Groundwater": The first line of the table states "Elevated nitrates from inappropriate use of animal waste, fertilizers, and pesticides." Pesticides do not contribute to elevated nitrate levels. The words "and pesticides" should be omitted.

Response: Pesticides omitted

3. Line two of the table refers to "Toxics from inappropriate use of pesticides" According to the USGS study Pesticides in Selected Small Streams in the Puget Sound Basin, 1987 – 1995 urban use of pesticides was more than three times greater than agricultural use. Contamination from pesticides can occur even from appropriate use of pesticides. The sentence should read, "Contamination from use of pesticides agriculture, urban / suburban development."

Response: Language changed as suggested

4. Chapter 2, page 4: Add the phrase "and fertigation" to "Chemigation" in the first row and first column under the WSDA column. In addition, it might be appropriate to add pesticide enforcement and licensing and certification.

Response: Fertigation added. Table now is Chapter 6

5. Chapter 3, page 17: "8. Pesticides" is a general discussion about pesticides. A few changes need to be made to make this statement more accurate. I suggest the following:

Change second sentence to read “Pesticides have beneficial characteristics when used appropriately, however they can also impact nontarget organisms when not used according to the label and consequently enter the environment. Some pesticides are toxic to nontarget organisms including humans. Historical pesticides like DDT accumulate in the food web, while some newer products break down fairly rapidly once released into the environment. When conducting water quality assessments, potential pesticide concentrations in the water, sediment and animal tissue should be considered.”

Response: Discussion deleted from Public Review Draft

6. Page 17, same section, second paragraph: Change to read “The Environmental Protection Agency (EPA) requires acute and chronic aquatic life criteria for all registered pesticides used outdoors. Pesticides are measured.....”

Response: Discussion deleted from Public Review Draft

7. Page 34, first paragraph under the heading “Description”, listed under the title “Activity – OTHER”: The last sentence in the paragraph titled “Pesticides and Fertilizers” reads: “Since the range of use of pesticides and fertilizers is so broad, there is an absence of information concerning their transport to receiving waters.” I would propose rewording that to read: “Since there is a wide variety of pesticide and fertilizer uses, it is difficult to identify and quantify their transport to receiving waters.”

Response: Change made

8. Chapter 5, page 56: First bullet at the top of the page (located under the heading “Key Implementers of the Strategy, State Agencies) refers to the Department of Agriculture. It should read: “Department of Agriculture encourages the use of best management practices (BMP), and regulates the use of pesticides and the make-up and distribution of commercial fertilizers”. The reference to “other agriculture-related toxins” should be omitted.

Response: Section on key implementors removed from Public Review Draft

9. Chapter 6, page 60: The first two paragraphs referencing the governor’s salmon recovery plan and the agricultural strategy should include the idea that all agricultural BMPs will be evaluated to determine if they meet requirements of the Clean Water Act and the Endangered Species Act. Those BMPs that do not meet these standards will be upgraded.

Response: Language added

10. Page 61, under “Existing Statute(s) and Regulations”, include the following WSDA statutes and rules:
 - Washington Pesticide Control Act (Chapter 15.58 RCW)
 - General Pesticide Rules (Chapter 16-228 WAC)
 - Washington Pesticide Application Act (Chapter 17.21 RCW)
 - Rules Relating to Fertilizers, Minerals and Limes (Chapter 16-200 WAC)

Response: These statutes and regulations were added

11. Page 63, first list of bulleted items, the second bullet should read: "Conservation Reserve Enhancement Program (CREP)". Remove the question mark in the acronym. In addition, the bullets listed under the section titled "General Agricultural Needs" talks about what agencies should do for agriculture. It does not communicate that fact that these tasks are being carried out. I might change the wording to "...continue to coordinate...."

Response: Changes made as suggested

12. Page 64, amend sixth bullet. Change second sentence to read: "Support Ground Water Management Areas (GWMA) around the state."

Response: Done

13. Page 64, amend seventh bullet. Change sentence to read: "Establish an MOA with NRCS and WSU to develop evaluation for BMP effectiveness." I would also suggest spelling out some of the acronyms so that it doesn't look like alphabet soup.

Response: Done, we've developed a list of acronyms

14. Page 65, first paragraph is missing language after the third line.

Response: Sentence fixed

15. Page 71, the first paragraph titled "Education" under the heading "Description of Current Programs" should include a reference to the WSDA Chemigation and Fertigation Technical Assistance Program. The following language could be included:

"The Department of Agriculture's Chemigation and Fertigation Technical Assistance Program is working with growers to protect water resources from the potential hazard of pesticides and fertilizers. Agriculture staff are also evaluating current fertigation rules to determine what revisions need to be made to provide more protection to ground water from fertigation practices."

Response: Paragraph added

16. Page 73, Under "Description", I would suggest removing bullets one and two. These ideas are part of the Integrated Pest Management (IPM) approach as described below.

Response: The list of bullets come from federal guidance. Those are the findings and deficiencies the state needs to meet in order to get federal approval. In a number of cases, we just need to show that we have programs in place. In other cases, we need to develop programs.

17. Page 73, Under “Description” IPM should be defined and presented as it reads in state law. You may recall that the 1997 Washington State Legislature passed Substitute Senate Bill 5077 which requires implementation of integrated pest management (IPM) by all state agencies and state educational institutions with pest control responsibilities. According to RCW 17.15.010, IPM is defined as:

“IPM means a coordinated decision-making and action process that uses the most appropriate pest control methods and strategy in an environmentally and economically sound manner to meet agency programmatic pest management objectives. The elements of integrated pest management include:

preventing pest problems;

- a. monitoring for the presence of pests and pest damage;
- b. establishing the density of the pest population, that may be set at zero, that can be tolerated or correlated with a damage level sufficient to warrant treatment of the problem based on health, public safety, economic, or aesthetic thresholds;
- c. treating pest problems to reduce populations below those levels established by damage thresholds using strategies that may include biological, cultural, mechanical, and chemical control methods and that must consider human health, ecological impact, feasibility, and cost-effectiveness; and
- d. evaluating the effects and efficacy of pest treatments.”

I’ve included a copy of the IPM legislation for your reference.

Response: We added all of the above

18. Page 73, under “Findings” second paragraph, the information listed is incorrect. The paragraph should read: “The Pesticide Applicators Act (17.21 RCW) and the Washington Pesticide Control Act (15.58 RCW) regulate the application of all pesticides in Washington state. These laws require pesticide users to carry out all requirements listed on the label. Additional licensing requirements exist for many pesticides, especially federal and state restricted use pesticides. In Washington State, pesticides labeled for aquatic environments are state restricted use.

Response: The findings are NOAA's and EPA's, and the language is theirs. We added your discussion under "Existing Statutes and Regulations."

19. Page 73, under “Existing Statutes and Regulations” include the following:
- Washington Pesticide Control Act (Chapter 15.58 RCW)
 - General Pesticide Rules (Chapter 16-228 WAC)
 - Washington Pesticide Application Act (Chapter 17.21 RCW)
 - Rules Relating to Fertilizers, Minerals and Limes (Chapter 16-200 WAC)

Response: Rules are included

20. Page 74, third paragraph under “Incentives”: The last sentence should read: “The Department of Agriculture compliance staff investigates complaints of pesticide misuse and take

enforcement action if necessary. They also perform a variety of inspections pertaining to the manufacture, sale, distribution, use and disposal of pesticides.”

Response: Language is inserted

21. Page 74, under the heading “Additional Needs”, you list “none”. However, it has become clear in recent years that there is a real need to educate urban communities about urban pesticide use. Although urban applications are usually small-scale, the wide variety of chemicals used and the frequency of applications can have a substantial impact on the environment. I strongly suggest you include the following:

“While the Department of Agriculture’s activities focus primarily on the agricultural industry, in recent years urban pesticide use has been recognized as a significant contributor to aquatic pollution. The Department of Agriculture has proposed using a Home2Ocean outreach and education campaign to help publicly owned treatment facilities protect local water quality. This would be done through educating the public about the wise use and proper disposal of pesticides. The California Environmental Protection Agency Department of Pesticide Regulation designed the campaign. The Department of Agriculture currently has no funding to begin a pilot Home2Ocean campaign project.

Response: Language inserted

22. Page 79, under heading “Education”, you might want to list the following: “The Department of Agriculture Chemigation and Fertigation Technical Assistance Program is working with growers to make sure their irrigation systems have the appropriate backflow prevention devices and other system components. Properly configured and functioning systems reduce the risk of contaminating surface and ground water.

Response: Language inserted

23. Page 80, under the heading “Additional Needs”, I recommend the following be added: “Due to the fact that there are more than 6,000 irrigation systems in the state, many of which are not in compliance and at risk of polluting the environment, more resources should be dedicated to bringing these systems into compliance. The Department of Agriculture Chemigation and Fertigation program staff of two is dedicated to helping the agricultural community bring these systems into compliance but is overwhelmed by the workload. Additional staff would make the task more realistic.

Response: Language inserted

24. Page 101, under the heading “Existing Statutes and Regulations” insert the following:
Washington Pesticide Control Act (Chapter 15.58 RCW)
General Pesticide Rules (Chapter 16-228 WAC)
Washington Pesticide Application Act (Chapter 17.21 RCW)
Rules Relating to Fertilizers, Minerals and Limes (Chapter 16-200 WAC)

Response: Rules added

25. Page 137, under heading “Existing Statutes and Regulations” you may want to include the Model Toxics Control Act.

Response: We included it

26. Page 138, under the heading “Description of Current Programs” include the following bullet:
“The Department of Agriculture Waste Pesticide Disposal Program has collected more than 940,000 pounds of unusable pesticides since 1988. The Waste Program also has educated thousands of pesticides users about waste pesticide minimization over the last eleven years.

Response: Language inserted

27. Page 138, under “Recommendations” change the bullet to read: “Fund and implement the Home2Ocean Campaign designed in California. The program.....”

Response: Done

28. Page 147, under heading “Existing Statutes and Regulations” you may want to include the Model Toxics Control Act.

Response: Done

29. Chapter 7, page 211 in one version and page 215 in the other version:
The second section of the matrix identifying “WSDA” and “Water Quality Program”, include the following:
educate pesticide applicators about water quality protection.
educate agricultural community about water quality and endangered Salmon.
conduct an aquifer vulnerability study to identify ground water at risk from agricultural practices.
Assist in ground water contamination investigations.

Your second version of this matrix eliminates the WSDA Water Quality Protection Program altogether. This is a major oversight as the WSDA should be included if this matrix is to be accurate.

Response: Matrix was removed from the Public Review Draft

32. Chapter 10, page 244: The last recommendation regarding a feasibility study on the conversion of open gravity canals to more efficient systems: The Department of Agriculture programmatic mandates do not include this activity, and would need more information on what specific commitment is being sought before any commitments could be made.

Response: Recommendation was removed from Table

30. Page 251, third and fourth lines of “Wetland, Lake, and Riparian Activities”: The Department of Agriculture programmatic mandates do not include this activity, and would need more information on what specific commitment is being sought before any commitments could be made.

Response: WSDA was removed as an implementing agency for mosquito control, but was kept as a participating agency for de-emphasizing use of chemicals for pest control

Comments from Department of Natural Resources, various reviewers

Agricultural Management:

1. In 1994 Legislature directed the Washington Department of Fish and Wildlife (WDFW) to develop standards by which to manage, preserve, and protect the ecosystem on state- owned agricultural lands, rangelands, or grazeable woodlands. These standards are known as House Bill (HB) 1309 Ecosystem Standards for State-Owned Agricultural and Grazing Land. The mandatory ecosystem standards are required for all state lands utilized for agricultural and grazing activities. In order to comply with this bill, state agencies, began to incorporate new policy. For instance, the DNR’s has integrated a Resource Management Plan (RMP) in all new agricultural leases and lease revision. An RMP is designed specifically for each lease and site condition in which it assesses the condition of the resource and targets the desirable ecological conditions.

As a result of RMPs, some valuable changes to land use patterns, primarily the minimization of land use activities, that contribute to the deterioration of ecosystem health and the loss of fish and wildlife habitat on more than one million acres of DNR’s agricultural lands alone.

Currently, these standards as well as the Natural Resource Conservation Service (NRCS) and the Field Office Technical Guides (FOTGs) are being discussed for use on private lands. These ideas are under discussion by industry, but there is no mention of this in the summary. A discussion of HB 1309 standards, NRCS and FOTGs needs to be added to the draft plan in light of their priority under current discussions by industry.

Response: Your discussion was added verbatim to Agricultural source control strategy.

2. We are concerned that this document places too great an emphasis on the Conservation Reserve Enhancement Program (CREP) (pg. 24) for protecting riparian habitat of farmland. Unfortunately CREP does not offer assistance with riparian protection for any areas other than Salmon and Stealhead Stock Inventory (SASSI) listings. In addition, CREP lacks support from private farmers due to several unresolved issues (pesticide use, conversions, permanent loss of land) and consequently is not enrolling the numbers of participants that it hoped to attract. A discussion of alternatives to this program need to be included in future documents.

Response: We do not over emphasize CREP. We identify it as one of many programs available to control nonpoint source pollution generated through agricultural activities.

3. It is our understanding that the Agricultural Conservation Program (as mentioned on page 25) was phased out in 96. A description of the Environmental Quality Incentive Program (EQUIP), administered by NRCS, or other similar program should be included instead of the Agricultural Conservation Program.

Response: In Chapter 4 we discuss EQIP, CREP, CRP and other conservation programs administered by NRCS

Aquatic Lands Management:

1. The broad approach is to be commended. It is good to see the realization that nonpoint pollution comes from a wide and large variety of sources. However, the relationship between these sources needs to be discussed in more depth. They are connected as part of the ecosystem and need to be thought about in terms of interconnected processes. Physical and chemical impacts are broadly linked within the plan, but not always consistently.

Response: We agree that more can be said. However, we did not have the time to go into as much depth in anyone category as we would have liked. Perhaps in the five year update we can do better.

2. Outcome and intermediate performance measures are important. There needs to be a well-defined set of indicators and a scorecard with a quantifiable end-point identified now.

Response: We updated the measurements of success table, Table 12.1., by adding milestones and monitoring activities. We plan to coordinate closely with the Salmon Strategy Balanced Scorecard process, and to refine our performance measures and milestones as we move through implementation activities

3. There needs to be a discussion of hydrology and hydrogeological processes included in the final plan to provide some background for the reader.

Response: We understand the need for discussions of that sort, however, given the time and scope of this document, we decided to minimize in depth technical narrative and to focus on programs and potentials.

4. There needs to be a discussion of the cumulative impacts associated with nonpoint source pollutants and the potential effects they could have on the environment.

Response: We originally had a narrative on cumulative impacts, but took it out thinking that Table 1.1 would give the reader a visual on cumulative impacts, since the discussion was a bit technical. The discussion has been saved on file.

5. In the discussion on exotic species, the point needs to be made that exotic species can either cause stress, or may be caused by (enhanced by) stress.

Response: Done

6. Overall, the draft seems to be somewhat dated and in need of a broader awareness/discussion of other ongoing programs. This should include projects which are providing cutting edge concepts such as: efforts in salmon restoration, and urban embayment cleanup and restoration in Commencement Bay and the Bellingham Bay Demonstration Pilot Project.

Response: There are reams of programs within the state that are in place to protect and restore water quality. Perhaps we can begin to capture those as we update and report on the implementation activities of this plan.

7. How are the CWA and ESA being coordinated?

Response: Good question, but don't have an answer for that one.

8. The Hazardous Waste Cleanup program is working on voluntary reduction of bioaccumulate chemicals of concern. How will the plan affect this program?

Response: We are not sure, but will make sure each Ecology Program has been briefed on the nonpoint plan.

9. There needs to be a discussion of dredging impacts, paying attention to economic development and overall cleanup actions and how that will affect overall water quality. Are long term benefits and impacts being truly balanced? Source control and re-contamination over long periods of time should be considered.

Response: We would love to have the discussion, or information, on each of your points. They are beyond what we can do for this plan, but will make for interesting discussion and addendum for the next iteration.

The following comments focus only on Estuarine and Nearshore sections:

1. Most of this section would benefit from incorporating some of the discussions from the report: Lynn, Brian. 1998. Nearshore Habitat Loss in Puget Sound: Recommendations for Improved Management. Washington Nearshore Habitat Loss Workgroup. Nov 1998, prepared for the Georgia Basin/Puget Sound International Task Force.

Response: Added some of Lynn's discussion to Chapter 5, Loss of Aquatic Ecosystems

2. P. 2-4 Estuaries and Nearshore. This section does not describe nearshore environments, the section from p. 5-175 should be inserted here.

Response: Information from 5-175 inserted into Chapter 2.

3. P 2-8 Ambient Monitoring- The section on Puget Sound Ambient Monitoring Plan (PSAMP) needs to be expanded. This program monitors many indicators of importance to nonpoint pollution. These need to be listed and discussed and shown how they can be used.

Response: One of the goals over the next five years is to develop a coordinated and statewide nonpoint monitoring strategy. When we do, the PSAMP, and others, will play a critical role.

4. Loss of Aquatic Habitats (p 5-164). This section should be renamed 'Freshwater Aquatic Habitats' or all the aquatic sections (including Lakes, Estuaries) should be included in one section with subsections for each type.

Response: Thanks for your suggestion

5. Estuaries (p. 5-176). This section should be elaborated on and should incorporate the discussions and recommendations from Brian Lynne, as well as the two Commencement Bay reports:

Graeber, Bill. 1999. Draft Puyallup River Delta Estuary Landscape Restoration Plan.

Lynne, Brian. 1998. Nearshore Habitat Loss in Puget Sound: Recommendations for Improved Management. Washington Nearshore Habitat Loss Workgroup. Nov 1998, prepared for the Georgia Basin/Puget Sound International Task Force.

Simenstad, Charles. 1999. Commencement Bay Aquatic Ecosystem Assessment; Ecosystem-Scale, Restoration-Scale for Juvenile Salmon Recovery.

Response: We added some of Lynn's work in this section.

6. National Estuary Program (NEP) is no longer active for Puget Sound- it is part of the Puget Sound Action Team (PSAT) and in the PSAT Workplan.

Response: The Puget Sound Workplan is the NEP for Puget Sound

Small Private Landowner Technical Assistance Service:
(Comments 8-14 are for the abridged version of the plan)

8. Page 8: The assertion that "forestry" is the sole source of coarse sediment from landslides is not correct. Much of urban and suburban land clearing and development are also responsible for many of the mass failures we have seen around the state, e.g., Kelso and lot of bluff properties on Puget Sound.

Response: Changes made

9. Page 11: Second paragraph; "Local governments play an extremely important role by passing ordinances that control land use." This is very true. The DNR Urban and Community Forestry (U&CF) program works with many developing communities in the formation of their ordinances dealing with natural resource preservation and management. Currently, the U&CF program is federally funded. The plan should state that with state support we could increase our

education and outreach efforts to assist communities further.

Response: Changes made

10. Page 11: Third paragraph; "Urban areas are the third...land coverage." The plan should also mention that urban areas are more than likely the only land use experiencing rapid growth. In fact, urban growth is probably 'swallowing up' forest, cropland, and livestock lands.

Response: Changes made

11. Page 14: Third recommended action; "Educate small landowners..." DNR Forest Stewardship Program currently works with many non-industrial private forest owners to develop long-term stewardship management plans for their property. The Forest Stewardship program is partially funded by USFS funds which are perennially at risk of cuts by federal legislators. Sustainable state support of this program would help ensure that those relationships are alive, and that forest stewardship education continues for a large segment of Washington landowners.

Response: Changes made

12. Page 14: Fourth recommended action; "Evaluate opportunities to purchase..." The DNR Legacy program is currently cooperating with USFS and the Mountains to Sound Greenway on conservation easements to protect the I-90 corridor. Development of additional land conservation organizations like Mountains to Sound would be beneficial to help with the coordinated management of these "at-risk" areas.

Response: Changes made

13. Page 15: Second recommended action; "Encourage cities.." The DNR U&CF program is currently working with many cities to fund tree planting projects. U&CF also educates cities and individuals on the importance of planting trees.

Response: Noted

14. Page 15: Third recommended action; "Develop incentives..." The plan only refers to preserving riparian areas as "natural buffers." Working with communities to develop incentives for municipalities and land developers in preserving a lot more of the tree canopy when they are developing these new areas should be emphasized.

Response: Noted

Recommendations Table

1. *County Road Administrative Board; Urb 30**: Wording should be modified to say, "Provide road maintenance guidelines to local communities and to county road programs."

Response: Language came from CRAB, "local communities includes counties."

2. *Dept. of Ecology; For7*: DNR should be added to the list of responding agencies. This is DNR's role because Washington State Forest Practices rules are the basis.

Response: This recommendation is specific to TMDL implementation

3. *Dept. Fish and Wildlife; For2*: This lists ESHB 2091 which may be unknown to some readers. It would be clearer to state "Forest & Fish."

Response: Forestry 2 has been deleted.

4. *Dept. Natural Resources; For3*: DNR should not be listed as lead agency for this project. Instead, the lead should be the Governor's Office.

Response: Done

5. *Dept. of Natural Resources; For 8*: The following agencies should be listed in this category: DOE, WDFW, and the Small Forest Land Owner Advisory Committee.

Response: Other agencies added

6. *Dept. of Natural Resources*; should also include the following category: Resource Damage Assessment. DNR should be the lead agency, but other agencies should include DOE, WDFW, and Tribes.

Response: We reduced the overall number of recommendations

7. *EPA*; should also include the following category: Providing assurances under the Clean Water Act for implementation of forest and fish. EPA, DNR, DOE, and should be categorized as 'New'.

Response: That is part of Forest and Fish implementation

8. *Natl. Marine Fisheries Service; Urb 8* should be expanded to read: "Complete programmatic Biological Assessments for transportation projects, forest and fish and other HCPs."

Response: Recommendation has been deleted

9. *USFWS; Urb 8*: should be expanded to read: "Complete programmatic Biological Assessments for transportation projects, forest and fish and other HCPs."

Response: Recommendation has been deleted

Comments received from Robin Bennett, Boeing

1. The Nonpoint Program needs to evaluate the interaction between permitted and non-permitted storm water discharges. Inefficient and ineffective programs may result without careful integration between the programs.

Response: We will try and evaluate the interactions as an implementation activity

2. Implementation and enforcement mechanisms need to be developed for nonpoint storm water. The inability to effectively enforce nonpoint provisions moves the onus to point sources – an inequitable situation.

Response: We agree

3. Unintended consequences in the regulatory arena are possible due to the Endangered Species Act consultation (Section 7) required to obtain EPA approval of the nonpoint plan under Coastal Zone Management Amendments.

Response: We have received that comment from others

Comments received from Anita Akselis, Overlake Oil

1. You mention in the draft that “preventing problems will always be much more practical and less expensive than treating existing ones.” One enormous potential problem that is not addressed in your draft is the practice of wet fueling of diesel fuel. (this comment is followed with a two page discussion)

Response: This is a new issue for us, and have very little information. Your concerns have been noted for future investigation.

Comments received from Debbie Becker, Washington State Dairy Federation

1. The commitment made by the dairy industry is more than words alone, it includes significant investments of time and money. In view of this, we must take exception to any language in this document that separates out the dairy industry or dairy waste from livestock or animal husbandry. (see pages 1-5, 3-1, 5-6, 5-7)

Response: We inserted the following discussion:

The major categories of animal feeding operations in Washington include beef cattle (290,000 mature animals), dairy cattle (260,000 mature animals), hogs and pigs (39,000 mature animals) sheep and lambs (62,000 animals) and poultry operations (animal numbers not available).

2. Furthermore, a comment is made on 5-7 about farm plans on dairy farms, without pointing out the dairy industry is by law (90.64 RCW) moving towards full farm plan implementation. No other industry can say that. No other state or federal government requires implementation of farm plans. The tone of these paragraphs are offensive.

Response: We inserted the following on page 5-7:

Dairy farms are the only category of animal feeding operation currently required to develop and implement nutrient management plans to prevent and correct water pollution problems. The 1998 Dairy Nutrient Management Act (Chapter 90.64 RCW) requires nutrient management plans be developed and fully implemented by December 31, 2003. Water pollution issues at other categories of animal feeding operations have been and will continue to be addressed through complaints and the Total Maximum Daily Load requirements in the federal Clean Water Act.

3. We do agree with the comment on 5-12, regarding the need for adequate funding for dairy nutrient management planning. This is one of our biggest concerns. Without proper funding we as an industry cannot achieve the industry supported timelines in 90.64 RCW. In your management measures, section 5 states several times that the Conservation Commission provides \$1.5 million in cost-share funds specifically for dairy producers every two years. This is not adequate funding to meet the deadlines.

Response: We agree and support increased funding to provide increased technical and financial assistance for dairy farms to meet the planning requirements in Chapter 90.64 RCW

4. We understand from verbal communication with Ecology personnel that this proposal is seen as a voluntary approach.... This document at least as far as agriculture is concerned, reads very much like a rule in many areas, especially the inferences in the source control strategy beginning on 5-7.

Response: While the language in the source Control Strategy beginning on page 5-7 does cite certain legal authorities (See 1995 General Finding from EPA and NOAA, page 5-8 and Existing Statutes and Regulations, page 5-9) these are back-up enforceable policies that are required to be identified in the document that may be utilized if a voluntary approach is not successful.

5. Perhaps the greatest single concern we have is the creation of expectations in this document; expectations that may not be achievable. Much effort is spent citing the Governor's Salmon plan, "Extinction is not an option," showing how its implementation will address many NPS issues. Yet there is no universal political or financial support for the Governor's Salmon Plan, and using that plan for the next 5 year NPS strategy, seems fraught with risk. Risk from outside lawsuits, risk from federal expectations created and risk that the funding and support will not be there, creating the failure of the department in the eyes of many.

Response: We won't know if their achievable until we try. This is the first time a nonpoint strategy has been developed for the whole state. We have to start sometime. If expectations are not met, then we will regroup in five years and try something else.

6. In addition to the above concerns is the question of how this all intertwines with the ESA and section 7 consultations. Does the department unwittingly create a trap, requiring something more after consultation? Does the department then create more financial risk for the people of the state? Especially if some goals are not met after consultation?

Response: This question has been asked prior by a few people. We don't have an answer, but have begun discussing this issue.

Appendix E

Letters of Concurrence

Concurrence received from Washington State:

Department of Health

Department of Agriculture

Department of Community Trade and Economic Development

Conservation Commission Washington State University Cooperative Extension

Department of Fish and Wildlife

Governor's Council on Environmental Education

Office of the Interagency Committee for Outdoor Recreation

Department of Natural Resources

Parks and Recreation Commission

Puget Sound Water Quality Action Team

Department of Transportation



STATE OF WASHINGTON
DEPARTMENT OF HEALTH

1112 SE Quince Street • PO Box 47890
Olympia, Washington 98504-7890
Tel: (360) 753-5871 • FAX: (360) 586-7424
TDD Relay Service: 1-800-833-6388

February 23, 2000

Tom Fitzsimmons, Director
Washington State Department of Ecology
Post Office Box 47600
Olympia, Washington 98504-7600 -

Dear Fitzsimmons:

Thank you for your letter of January 5 in which you request concurrence to Washington's Water Quality Management Plan to Control Nonpoint Source Pollution. I commend your department for all the effort in coordinating the development of this plan and its implementation. We support the goals and objectives of the plan.

The department has reviewed the plan and finds that the actions identified for the Department of Health are within the authority and mission of this agency. We concur with the plan and agree to implement the actions assigned to us.

We look forward to our continued participation in the implementation of this plan through the State Agency Nonpoint Workgroup. Selden Hall will continue as our designated representative on this workgroup. If you have additional questions or concerns, Mr. Hall may be reached at (360) 236-3043.

Sincerely,

MARY C. SELECKY

Secretary

cc: Selden Hall
Bill White



STATE OF WASHINGTON
DEPARTMENT OF AGRICULTURE

P.O. Box 42560 • Olympia, Washington 98504-2560 • (360) 902-1800

February 14, 2000

Tom Fitzsimmons, Director
Washington State Department of Ecology
P.O. Box 47600
Olympia, WA 98504-7600

Dear Mr. Fitzsimmons:

Thank you for your letter of January 5 in which you request concurrence to Washington's Water Quality Management Plan to Control Nonpoint Pollution. The department should be commended on its efforts to coordinate the development of the plan. We support the goals and objectives of the plan.

We have reviewed the plan and find that the actions identified are within the authority and mission of the Washington State Department of Agriculture. We concur with the plan and agree to implement the actions assigned to us in the plan. Details regarding specific budget issues and work plans will be managed through the State Agency Nonpoint Workgroup, of which this agency is a member.

We look forward to working with you in refining and implementing the plan and improving the quality of water within the state.

Sincerely,
Jim Jesernig
Director



STATE OF WASHINGTON
DEPARTMENT OF COMMUNITY, TRADE AND ECONOMIC DEVELOPMENT
906 Columbia St. SW • PO Box 48300 • Olympia, Washington 98504-8300 • (360) 753-2200

February 2, 2000

Mr. Tom Fitzsimmons, Director
Washington State Department of Ecology
Post Office Box 47600
Olympia, Washington 98504-7600

Dear Tom:

Thank you for your letter of January 5 in which you request concurrence with the Water Quality Management Plan to Control Nonpoint Source Pollution. We support the goals and objectives of the plan.

We have reviewed the plan and find that the actions identified are within the authority and mission of the Department of Community, Trade and Economic Development (CTED). We agree to implement the actions assigned to us both as lead agency and in coordination of actions with other state agencies. These actions include efforts relating to updating local critical area ordinance guidelines and models, including use of "best available science" for the protection of critical areas, and providing critical information, technical guidance, and maps to local governments in current land uses. Details regarding specific budget issues and work plans will be managed through the State Agency Nonpoint Workgroup, of which CTED is a member. i Ecology is to be commended on its efforts to coordinate the development of this plan. We look forward to working with you in its implementation to improve water quality within the state.

Sincerely,

Busse Nutley
Deputy Director for Community Development

cc: Chris Parsons, CTED
Steve Wells, CTED
Bill Hashim, DOE



STATE OF WASHINGTON
CONSERVATION COMMISSION

PO Box 47721 • Olympia, Washington 98504-7721 • (360) 407-6201 • FAX (360) 407-6215

January 11, 2000

Tom Fitzsimmons, Director
Washington State Department of Ecology
P.O. Box 47600
Olympia, WA 98504-7600 _

Dear Mr. Fitzsimmons:

Thank you for your letter of January 5 in which you request concurrence with Washington's Water Quality Management Plan to Control Nonpoint Source Pollution. Ecology should be commended for its efforts to coordinate the development of the plan. We support the goals and objectives of the plan.

We have reviewed the plan and find that the actions identified are within the authority and mission of the Conservation Commission. We concur with the plan and agree to implement the actions assigned to us in the plan. Details regarding specific budget issues and work plans will be managed through the State Agency Nonpoint Workgroup, of which this agency is a member.

We look forward to working with you in implementing the plan and improving the quality of water within the State.

Sincerely,

Steven R. Meyer
Executive Director

Cc: Commission Members

COOPERATIVE EXTENSION
Washington State University

SPOKANE

February 28, 2000

668.North Riverpoint Blvd., Box B
Spokane, WA 99202-1662
509-358-7960 FAX: 509-358-7900
TDD 1-800-833-6388

Tom Fitzsimmons, Director
Washington State Department of Ecology
PO Box 47600
Olympia, WA 98504-7600

Dear Mr. Fitzsimmons:

Thank you for your letter of January 5 in which you request concurrence to Washington's Water Quality Management Plan to Control Nonpoint Source Pollution. Ecology should be commended on its efforts to coordinate the development of the management plan. We support the goals and objectives of the plan.

We have reviewed the plan and find that the actions identified are within the authority and mission of Washington State University Cooperative Extension (WSU CE). We concur with the management plan and agree to work towards implementing the actions assigned to us in the plan. Details regarding specific budget issues and work plans will be managed through the State Agency Nonpoint Workgroup, of which WSU CE is a member.

We look forward to working with you in implementing the plan and improving the quality of water within the state.

Sincerely,

Michael J. Tate

Associate Dean and Director, Cooperative Extension



State of Washington

DEPARTMENT OF FISH AND WILDLIFE

Mailing Address: 600 Capitol Way N • Olympia, WA 98501-1091 • (360) 902-2200, TDD (360) 902-2207
Main Office Location: Natural Resources Building • 1111 Washington Street SE • Olympia, WA

February 15, 2000

Mr. Tom Fitzsimmons, Director
Washington Department of Ecology
Post Office Box 47600
Olympia, Washington 98504-7600

Dear Mr. Fitzsimmons:

Thank you for your letter regarding Washington's Nonpoint Management Plan. The Washington Department of Fish and Wildlife (WDFW) concurs with the recently completed Washington's Water Quality Management Plan to Control Nonpoint Source Pollution. We greatly appreciate Ecology's efforts to coordinate development of this plan. We support the intent, goals, and objectives of this plan. We especially appreciate enhanced recognition in the plan of the need to draw stronger relationships between nonpoint pollution and habitat quality.

A concern which we are all directly involved with is salmonid recovery. This includes necessary response to related federal Endangered Species Act (ESA) requirements. Plan General Assignment 12, facilitating the integration of the requirements of the Clean Water Act and ESA, is one key to this. As an example, we believe that water quantity and in-stream flow responsibilities between these authorities should be clarified.

We have reviewed the plan and find that implementation actions identified for WDFW are within its authority and mission. We agree to implement these actions consistent with WDFW resources and capabilities. We understand details of implementation will be managed through the State Agency Nonpoint Work Group, of which WDFW is a member.

We look forward to continuing to work with you in implementing this plan to further improve the quality of Washington's water resources.

Sincerely,

Jeff P. Koenings

Director

cc: Carl Samuelson

Bill Green

Governor's Council on Environmental Education

January 14, 2000

Tom Fitzsimmons, Director
Washington State Department of Ecology
PO Box 47600 Olympia WA 98504-7600

Dear Mr. Fitzsimmons:

The Governor's Council on Environmental Education concurs with Washington's Water Quality Management Plan to Control Nonpoint Source Pollution. We support the goals and objectives, and commend Ecology for coordinating the plan development.

We have reviewed the plan and determined that it concurs with the goals and priorities of the Governor's Council on Environmental Education. We agree to implement the actions assigned to the Council by the plan.

We are confident that our continued collaboration will improve the quality of water within Washington.

Sincerely,

Cleve Pinnix

Chairman

Interagency Committee for Outdoor Recreation
360/902-3000
360/902-3026 (fax)
email: info@iac.wa.gov



Salmon Recovery Funding Board
360/902-2636
360/902-3026 (fax)
email: salmon@iac.wa.gov

STATE OF WASHINGTON
OFFICE OF THE INTERAGENCY COMMITTEE
1111 Washington Street SE
PO Box 40917
Olympia, WA 98504-0917

March 30, 2000

Tom Fitzsimmons, Director .
Department of Ecology .
PO Box 47600
Olympia, 98504-7600

Dear Mr. Fitzsimmons:

This is in response to your letter of January 5th, requesting concurrence to the Nonpoint Source Pollution Control Plan.

After review of the draft Plan, we identified several minor technical revisions to items identified for IAC lead. Your staff was most helpful in working With us on those changes. As revised, we are pleased to concur with the Plan, and will implement the actions assigned to us. We understand that details regarding budget issues and work plans will be managed through the Nonpoint Workgroup, of which this agency is a member.

The Nonpoint Plan represents an excellent effort to coordinate many agencies and actions. We're pleased to support your work on this important, complex issue.

Sincerely,

Laura E. Johnson
Director

Cc: Bill Hashim, Ecology
Jim Fox, IAC

WASHINGTON STATE DEPARTMENT OF

Natural Resources

JENNIFER M. BELCHER
Commissioner of Public Lands

April 14, 2000

Tom Fitzsimmons, Director
Washington State Department of Ecology
PO Box 47600
Olympia, WA 98504-7600

Dear Mr. Fitzsimmons:

Thank you for your letter of January 5, 2000 in which you request concurrence to Washington's Water Quality Management Plan to Control Nonpoint Source Pollution. Ecology should be commended on its efforts to coordinate the development of the plan. We support the goals and objectives of the plan.

We have reviewed the plan and find that the actions identified are within the authority and mission of the Washington Department of Natural Resources. We concur with and agree to implement the actions where we are identified as the lead implementing agency as time and budget allow. Where we are listed as a participant, we will work with others as time and budget allow when mutual goals and priorities can be achieved. However, we believe that the plan falls short of what should be done. We are concerned that near shore and estuarine environments, cumulative impacts, and the connections between many processes are not adequately addressed in the plan (as was stated in our earlier comments dated Nov. 22, 1999 and Dec. 15, 1999) to achieve a holistic water quality strategy for controlling nonpoint pollution.

We are looking forward to identifying new opportunities to work with Ecology and others, in addition to implementing the actions identified in the nonpoint plan, to address nonpoint pollution, habitat restoration and enhancement measures that reach the marine/estuarine environments.

Sincerely,

Kaleen Cottingham

Deputy Commissioner of Public Lands

KC:dd

c: Jennifer Belcher, Commissioner of Public Lands



STATE OF WASHINGTON

WASHINGTON STATE PARKS AND RECREATION COMMISSION

7150 Cleanwater Lane • P.O. Box 42650 • Olympia, Washington 98504-2650 • (360) 902-8500 Internet Address: <http://www.parks.wa.gov>
TDD (Telecommunications Device for the Deaf): (360) 664-3133

January 13, 2000

Tom Fitzsimmons, Director
Washington State Department of Ecology
PO Box 47600
Olympia, WA 98504-7600

Dear Mr. Fitzsimmons:

Thank you for your letter of January 5 in which you request concurrence to Washington's Water Quality Management Plan to Control Nonpoint Source Pollution. Ecology should be commended on its efforts to coordinate the development of the plan. We support the goals and objectives of the plan.

We have reviewed the plan and find that the actions identified are within the authority and mission of the Washington State Parks and Recreation Commission. We concur with the plan and agree to implement the actions assigned to us in the plan. Details regarding specific budget issues and work plans will be managed through the State Agency Nonpoint Workgroup, of which this agency is a member.

We look forward to working with you in implementing the plan and improving the quality of water within the state.

Sincerely,

Cleve Pinnix Director

Cc: Bill Jolly, Manager, Environmental Program
Dona Wolfe, Parks and Recreation Coordinator, Boating Program
Karmen Martin, Environmental Specialist, Environmental Program

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STATE OF WASHINGTON
PUGET SOUND WATER QUALITY ACTION TEAM
OFFICE OF THE GOVERNOR
PO Box 40900 • Olympia, Washington 98504-0900
(360) 407-7300 • FAX (360) 407-7333

January 14, 2000

Tom Fitzsimmons, Director
Washington State Department of Ecology
PO Box 47600 Olympia, WA 98504-7600

Dear Mr. Fitzsimmons:

Thank you for your letter of January 5 in which you requested concurrence with *Washington's Water Quality Management Plan to Control Nonpoint Source Pollution*. We appreciate Ecology's efforts to coordinate agency participation on the plan. Bill Hashim has gone out of his way to keep us informed and to incorporate our comments. In general, we support the goals and objectives of the plan.

We have reviewed the plan and recently provided Bill Hashim with some clarifications of our actions and roles. As modified by our recent comments, we find that the actions identified are within the authority and mission of the Action Team support staff. We concur with the plan and will endeavor to implement our actions in the plan.

The plan anticipates that details regarding specific budget issues and work plans will be managed through the State Agency Nonpoint Workgroup, of which we are a member. The Puget Sound Water Quality Action Team is also responsible for developing biennial work plans to implement the Puget Sound Water Quality Management Plan. We will work with Ecology to ensure coordination between development of Ecology's nonpoint work plan and development of the Puget Sound work plans.

We are looking forward to working with you in implementing the plan and improving water quality in Puget Sound.

Sincerely,

Nancy McKay Chair

Washington State
Department of Transportation
Sid Morrison
Secretary of Transportation

Transportation Building
P.O. Box 47300
Olympia, WA 98504-7300

January 25, 2000

Tom Fitzsimmons, Director
Washington State Department of Ecology
PO Box 47600
Olympia WA 98504-7600

Dear Mr. Fitzsimmons:

Thank you for your letter of January 5, in which you request concurrence to Washington's Water Quality Management Plan to Control Nonpoint Source Pollution. We support Ecology's efforts to coordinate the development of the plan. We encourage integration of water quality controls and water quantity concerns in the context of watershed management in order to prioritize actions. We support the goals and objectives of the plan, based on available funding.

We have reviewed the plan and find that the actions identified are within the authority and mission of the Department. We concur with the plan and agree to implement the actions assigned to us in the plan. Details regarding specific budget issues and work plans will be managed through the State Agency Nonpoint Workgroup, of which this agency is a member.

We are looking forward to working with you in implementing the plan and improving the quality of water within the state.

Sincerely,

Sid Morrison
Secretary of Transportation
SM:bdv
Enclosures

cc: Bert Bowen, WSDOT
Leni Oman, WSDOT